CLIENT/SERVER

JOURNAL

Frank Petersmark Illuminates The Way For Amerisure

- **AGENTS OF CHANGE**
- **CLIENT/SERVER CICS?**
- **DIRECTORY CHAOS**

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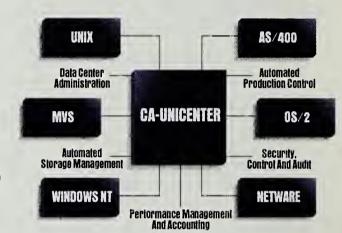
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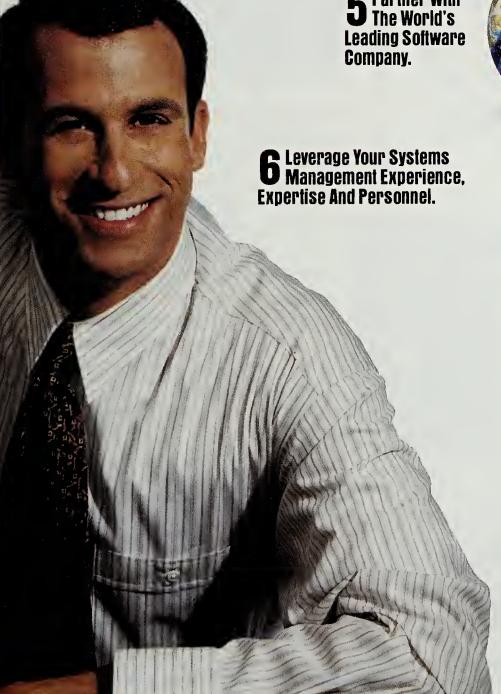
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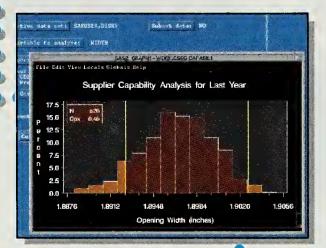
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EDITOR'S NOTE

Alan Alper

Even technological laggards are looking to rejigger their business processes via client/server technology.

IMAGINE TRYING TO BUILD AN ENTERPRISE-wide, client/server system with zero experience — and even fewer resources? Can't be done, you say, having been involved in the development of a couple of complex, distributed systems yourself!

Well, everyone has to start somewhere. And one look at the predicament of Amerisure, a Midwestern insurance company, and The Liggett Group, a Durham, N.C., cigarette maker, will give you a better appreciation of how much can be accomplished with scarce resources and limited time.

Both organizations' stories, told in this issue ("Illuminating the Way," page 42, and "Tech Cures on Tobacco Road," page 33), make it clear that even technological laggards are looking to rejigger their business processes via client/server technology.

All Amerisure had to begin its client/server sojourn was faith, legacy systems and people. But within three years, the company has built a distributed computing environment that cuts from weeks to hours the time it takes to write a commerical insurance policy.

Liggett, on the other hand, was fighting for survival. Profit pressure and increased government scrutiny were threatening its very existence. The company brought in a "mercenary CIO" to lead the re-engineering charge. Within 18 months, Liggett's disconnected systems and ineffective business processes were replaced with an integrated, flexible architecture that enables the company's disparate organizations to share critical business data.

While distributed computing cannot guarantee that either company will remain competitive, it is the means by which the two organizations will continue to evolve both their technological infrastructure and — more important — the way they conduct business.

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SPEAKING OF ALTERATIONS, CLIENT/SERVER JOURNAL HAS SOME changes looming. Beginning with the February 1995 issue, CSJ will be publishing bi-monthly. We're doing this for one primary reason — you! You've told us you hunger for more client/server coverage. You desire additional insight into distributed technology trends, more in-depth case histories, a better understanding of technology/business alignment and more product news and reviews. Well, we hear you.

With this issue, you'll get a glimpse of what's to come. Our "What's New" section includes new product news, a hands-on review and a product evaluation of Windows NT Server from people like you. We intend to focus on one particular technology area in every issue, rotating coverage of application development tools, database technology and networking — the client/server constants. We'll also probe the client/server travails of organizations in a vertical market. In this edition we look at the utilities industry. In coming issues we will focus on banking, brokerage, health care, transportation and insurance.

You, the reader, are driving our changes. My various addresses are at the bottom of this page. Let me know what you think!

Alan Alper

INTERNET: aalper@cw.com

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PROGRESS VERSION 7. MISSION-CRITICAL MEETS CLIENT/SERVER.

Letters

H AVING JUST READ AN ARTICLE BY Avery Jenkins in your August *Client/Server Journal*, I'm a bit perplexed.

We have Omnis 7 at Lehigh, and if it's object-oriented, I'd like to know in what way. I don't see much encapsulation, polymorphism or inheritance in Omnis.

If the author is referring to the fact that Omnis is graphical, then he has a poor understanding of object-oriented programming.

I would have expected better from you guys.

TOM SMULL
Lead systems analyst,
Administrative Systems
Lehigh University
Bethlehem, Pa.

Editor's Note: Perhaps you haven't seen the last few releases of Omnis 7? Blyth Software, Inc. has added elements of inheritance and polymorphism in the last two releases. In addition, Omnis 7 allows for the creation of reusable objects through procedural coding.

B RAVO! THE AUGUST ISSUE OF *Client/Server Journal* is one of the best issues about client/server I've ever read. It's about time someone in this industry understands that client/server doesn't mean having a PC and a server running together on a network.

Bringing information to your fingertips through a piece of software (i.e., middleware) is where things really start to count in client/server. Providing a transparent environment which everyone can use or benefit from is where client/server really

shines. Integrating HP, Sun, AT&T and DEC into a heterogeneous environment is easy and has been possible for years. Now try sharing data on all those platforms!

I'm glad someone understands that the hardware portion of client/server is just that, a *piece* of the solution. Too many other variables are involved to be ignored.

Thanks very much for your insightfulness and diligence with client/server.

KEITH BRODHEAD JR.
Account executive
ECCS, Inc.
Tinton Falls, N.J.
Internet: kbrod@eccs.com
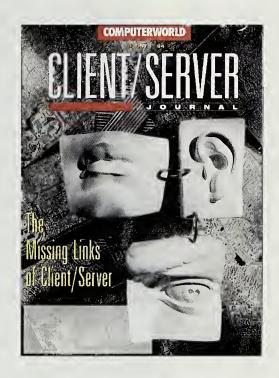
G OT MY COPY OF THE AUGUST issue this morning. Checked out "The Missing Links of Client/Server" — great article!

You have a real winner here. This publication is the best I've found on the topic — crisp, good writing, timely coverage of the industry and an editorial bent that respects the intelligence of the readers. Well done! Make it a monthly, and keep it coming.

PETER KOSAR
Partner
Treeter Consulting Group
Oakland, Calif.
Internet: treeter@netcom.com

C ONGRATULATIONS ON YOUR sobering article "The Missing Links of Client/Server" in the August issue. Rather than hop on the bandwagon and paint a rosy picture of client/server technology, you have chosen a starkly realistic view.

Companies must realize that cli-

ent/server is not a "magic bullet" that will make all of their development woes disappear. It is another step on the evolutionary chain of software, and like our first ancestors who crawled out of the sea and onto dry land, it is a painful process.

PC gurus must now be concerned with aspects of multiuser environments, such as contention and data integrity. Mainframe developers must rethink their role in the company's system strategy. Management must have the vision to provide the "hooks" to facilitate seamless expansion. And, as pointed out in this article, there is a dicey communications and recovery layer to contend with.

It is only through acknowledgment of these issues that client/server can fulfill its promise. Keep up these insightful articles.

ROY ALTMAN
Senior consultant
Trecom Business Systems
New York

Computerworld Client/Server Journal *will publish letters on relevant client/server computing issues. Letters will be edited for brevity and taste. Write Editor Alan Alper at 375 Cochituate Road, Framingham, Mass. 01701 or via Internet at aalper@cw.com, MCI Mail at 598-8002 or CompuServe at 72303,1037.*

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INSIGHTS

Keeping Stock Trades Honest

SOUTH KOREA'S ECONOMIC rise has fueled rapid growth in securities trading on the nation's stock market — and raised concerns about inappropriate and illegal transactions.

Enter a client/server market surveillance system developed by Chul H. Ahn, a consultant to the Korean Stock Exchange and professor of applied statistics at Sejong University in Seoul. The system, which went live last month, scrutinizes the 50 million trades made daily on the 1,000 issues listed on the exchange.

Developed with SAS Institute, Inc.'s namesake product, the system analyzes unusual movements in individual stocks by comparing the trade in question with historical pricing and volume data. Transaction data is downloaded from a Unisys Corp. mainframe that handles trading and clearing to a Control Data Corp. Cyber server running Unix.

If a particular transaction exceeds established criteria, the server alerts a Unix workstation connected over a Fiber Distributed Data Interface network, where staffers use SAS' statistical analysis and graphing software to examine the trade in near real time.

In the past, detection of unusual trading activity

Chul Ahn developed this surveillance system to catch illegal trading

was handled manually in batch mode. Availability of mainframe trading and clearing data lagged by a day and had to be rekeyed into a PC for further analysis, Ahn explained. Uniform detection criteria applied to all stock trades didn't account for idiosyncratic volatility and further hobbled the process.

The three-year, $8.5 million project experienced typical client/server networking glitches. Getting data from the mainframe to the client safely via the server was particularly irksome, Ahn said.

Market surveillance systems have become de rigeur in the U.S. and Europe, following the insider trading scandals of the 1980s. Exchanges and regulatory agencies are increasingly turning to client/server to keep traders

and the markets honest, analysts said.

"This will allow Korean traders to be more confident and exert more control over their members," Ahn conceded.

Still, there's more work to do. Ahn said he hopes he and the Korean Stock Exchange's 50-person development team will finish by year's end an off-line, SAS-based system to give the exchange's auditors even more analytical tools. ◾

Written by Alan Alper, editor of Computerworld Client/Server Journal.

SNIPPETS

☞ In a session at Client/Server East's Executive Forum, Fannie Mae Executive VP and CIO William Kelvie stressed four ways to trip up a client/server move. The move will fail if your organization has users who refuse to prototype, if you don't break projects into six- to nine-month chunks, if you re-engineer from the bottom up instead of top down, and if you rely on ad hoc tool selection.

☞ Fewer than 5% of U.S. firms effectively quantify or control expenditures on PCs and LANs, an International Technology Group survey of 250 U.S. companies found. Further, management has no real knowledge of the size of these expenditures.

☞ Client/server is a "snapshot in time in the evolution of IS," said Adrian Kole, president of AGK Associates, Inc., at a session on managing client/server costs sponsored by Technology Managers Forum in New York. Only the IS function understands this. Thus, CIOs must take charge of the migration, Kole said.

☞ Moving to client/server can be hard. Enter the Client/Server Exchange, a partnership between the University of Michigan and IBM designed to promote the use of open, standards-based, client/server technologies. For more information, call (313) 764-5440 or send E-mail to info@citi.umich.edu.

The difference between rehearsal and performance is experience.

Why IBM for Client/Server.

Client/server computing is great for your people because it gives them easier access to more information. It's great for your business because it removes barriers between existing systems, giving you new flexibility to improvise, to reorganize, to reengineer.

So your question isn't whether to explore client/server, it's what to look for in the people who help you, and here's a suggestion. If they don't have a long list of references in multiplatform, multivendor integration and if they don't have solid knowledge of your kind of business, call someone who has. Someone like IBM.

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Also, we keep careful track of everything we learn. Each client/server solution is unique, but we'll compare your situation with ones we've faced before to give you the direct benefit of real-world experience. What's more, we can help you at any stage — from initial consulting to implementation — and we now have 40 IBM Open System Centers worldwide for testing multivendor solutions before installation.
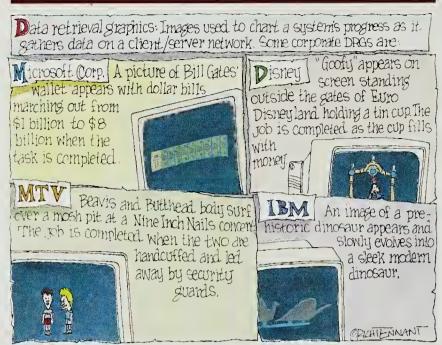
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The 5th Wave

Data retrieval graphics: Images used to chart a system's progress as it gathers data on a client/server network. Some corporate DRGs are:

Microsoft Corp. A picture of Bill Gates' wallet appears with dollar bills marching out from $1 billion to $8 billion when the task is completed.

Disney "Goofy" appears on screen standing outside the gates of Euro Disneyland holding a tin cup. The job is completed as the cup fills with money.

MTV Beavis and Butthead body surf over a mosh pit at a Nine Inch Nails concert. The job is completed when the two are handcuffed and led away by security guards.

IBM An image of a pre-historic dinosaur appears and slowly evolves into a sleek modern dinosaur.

CONFERENCES

■ **CIO LYCEUM — CLIENT/ SERVER: THE MORNING AFTER**
Los Angeles, Nov. 8-9
Aims to provide CIOs with a forum to discuss issues critical to their success. Guest speakers include Charles Schwab & Co.'s Dawn Lepore, Gartner Group, Inc.'s Bruce Rogow and Cambridge Technology Partners' Thornton May. Contact: Cambridge Technology Partners, Cambridge, Mass. (617) 374-9800.

■ **CLIENT/SERVER WORKSHOP**
Santa Clara, Calif., Nov. 8-10
Includes labs and keynote addresses by Pieter Mimno, Jeff Tash and Rich Finkelstein as well as management and technical seminars. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

■ **E-MAIL WORLD**
Boston, Nov. 29-Dec. 1
Conferences include "Enabled Mail Applications" and "Electronic Commerce and E-mail Infrastructure." Keynotes by Lotus Development Corp.'s John Landry and Electronic Frontier Foundation's Mitchell Kapor. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

■ **IT SERVICES '94 CONFERENCE**
Santa Clara, Calif., Dec. 5-7
"Client/Server: Myth vs. Reality" is a panel discussion on how client/server can enable companies to respond to business challenges. Contact: Creative Expos & Conferences (508) 660-7099.

■ **DB/EXPO**
New York, Dec. 5-9
Exhibition and conferences focus on database and client/server computing. Keynotes by Microsoft Corp.'s Jim Allchin, Sybase, Inc.'s Robert Epstein and Gupta Corp.'s Umang Gupta. Contact: Blenheim NDN, Inc., Mountain View, Calif. (800) 232-3976.

■ **SUCCESSFUL NOTES DEPLOYMENT STRATEGIES**
Boston, Dec. 13-14
Learn how to choose and manage Notes pilot projects and how to grow the use of Notes rapidly in your firm. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

■ **INFRASTRUCTURE MANAGEMENT & PLANNING FOR CLIENT/SERVER**
San Diego, Jan. 17-19
This seminar shows participants how to establish an effective systems architecture and management techniques for supporting client/server. Contact: Center for Information Technology at San Diego State University, San Diego, Calif. (619) 594-6190.

■ **LOTUSPHERE '95**
Orlando, Fla., Jan. 22-26
Brings together developers, system administrators, IS professionals and Lotus Business Partners for in-depth technical, strategic and business sessions. Contact: J. R. Schuman Associates, Waltham, Mass. (617) 894-5326.

■ **COMNET '95**
Washington, Jan. 23-26
Networking showcase features tutorials such as "Client/Server in the Global Environment." Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

Top 10 things

that are still true in building applications that perform well

10. Users want fast response time.

9. Slow response time or slow batch jobs are usually caused by too many I/Os.

8. Database design is still the most important performance factor.

7. The physical sequencing of data in a table is still a powerful design tool.

6. Database tables still have to be reorganized to ensure performance.

5. Batch system design is still important.

4. Sometimes simply buying more hardware can solve your performance problems (and it's like playing poker).

3. It's tough to get people to spend money on performance engineering to prevent performance problems from occurring.

2. It's still important to have an understanding of the DBMS you are using.

1. Code reviews are still necessary.

Note: You can give your users more functionality, push buttons, drop-down list boxes, objects, distributed data and virtual reality. You might even save them some money.

But none of these will change No. 10.

Source: CSC Consulting, Inc., Boston

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Although there's a growing number of vendors who claim to provide middleware solutions, choosing the wrong one could have disastrous results for you and your company.

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Information Builders

Projects to Watch

Phoenix Newspapers, Inc., publisher of *The Arizona Republic*, *The Phoenix Gazette* and *The Arizona Business Gazette*, has signed on with BSG Corp. for its move to client/ server. The three-year contract is to replace the publishing company's business-side systems. Phoenix Newspapers has migrated from a Honeywell Bull, Inc. mainframe to a server platform of Sun Microsystems, Inc. SPARCcenter 2000s, with other Sun, Novell, Inc. and Notes servers. Clients include Sun, Intel Corp.-based and Macintosh platforms. A Sybase, Inc. System 10 is the back-end database, with client processing done by various front ends. Phoenix Newspapers plans to go live with its converted financial applications in four to five months.

☞ JUVENILE CLIENT/SERVER

Needing to maintain records on more than 36,000 juveniles and some 42,000 family members that have had contact with Family Court, the 22nd Judicial Circuit Court of Missouri in St. Louis turned to the Juvenile Tracking System (JTS) for help. JTS handles all aspects of a juvenile's activity in court . JTS runs on DOS or Windows clients attached to a Novell 3.x LAN. The database engine is Novell's NetWare SQL Version 3.0, and the principal application development tool is JAM from JYACC, Inc. There are more than 15 of a total 50 clients using the program on a LAN, and all 50 clients will eventually have access to the program. JTS was fully operational in May and is under consideration for adoption on a statewide basis.

☞ TRACKING SALES AT SAKS

Using an executive information system/decision support system, Saks Fifth Avenue executives can now better track sales information from their 80 stores worldwide. Trinzic Corp.'s Forest & Trees acts as a front end to Saks' Sybase database on Sun servers. Executives and managers can now point and click to see reports on revenue from the previous day as well as a comparison of sales from the previous year. Saks' "Morning Flash" report is automatically generated each morning by Forest & Trees Scheduler.
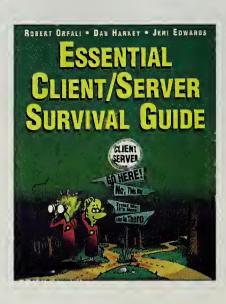
BUZZWORDS

A compendium of recently generated buzzwords:

- **DATA RETAILING:** An extension of data warehousing. Putting warehoused data in a form that is more easily accessible and usable.

- **HERITAGE SYSTEMS:** The upside of legacy systems. Mainframe applications that are working so well they shouldn't be moved to client/server (i.e., if it ain't broke, don't fix it).

- **FACE-LIFTING:** Putting a GUI front end on a legacy system.

- **USER IMPERSONATION:** Using custom performance tests to identify glitches before putting a client/server application into production.

- **LAN-IN-A-CAN:** IBM euphemism for LAN server consolidation.

BOOK REVIEWS

ESSENTIAL CLIENT/SERVER SURVIVAL GUIDE

Robert Orfali, Dan Harkey and Jeri Edwards

What do Bob Dylan, cartoons and client/server computing have in common? The Essential Client/Server Survival Guide combines the three into a client/server handbook, sprinkled with humor and geared for anyone who wants to learn about and work with client/server technology. The book outlines the basic client/server model and then offers overviews of the most important client/server technologies. The pros and cons of each topic are also discussed, and the authors state their opinions in well-labeled "soapboxes" included in each chapter. The 527-page survival guide costs $24.95. ISBN: 0-442-01941-6. Van Nostrand Reinhold, (800) 842-3636.

CLIENT/SERVER SYSTEM DESIGN AND IMPLEMENTATION

Larry T. Vaughn

Part of the McGraw-Hill Series on Computer Communications, Client/Server System Design and Implementation is a step-by-step guide to building a client/server environment. It aims to explain the techno-babble that accompanies many of the technological and marketing trends affecting client/server implementation. It looks specifically at the development of database-oriented client/server applications from basic technology to methodologies and organizational issues. This 224-page book costs $45. ISBN:0-07-067375-6. McGraw-Hill, (800) 822-8158.

Other books to consider:
THE RE-ENGINEERING HANDBOOK: A STEP-BY-STEP GUIDE TO BUSINESS TRANSFORMATION

Raymond L. Manganelli and Mark M. Klein; 288 pages; hardcover; $29.95; ISBN: 0-8144-0236-4. Amacom, (212) 903-8315

CLIENT/SERVER MANAGEMENT HANDIGUIDE
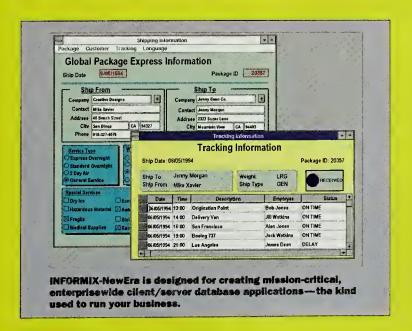
M. Victor Janulaitis; 325 pages; $395. Positive Support Review, Inc., (310) 453-6100.

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"Sybase gave us the price/performance we needed to justify our massive reengineering effort."
— *Jack Hazel, Senior Systems Analyst, Illinois Employee Benefits Corp., which manages more than $1 billion for midwestern unions.*

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*The trick for IS is to figure out how to implement the technology
so it boosts productivity rather than creates chaos*

SOFTWARE AGENTS, THOSE small pieces of code programmed to handle background or remote tasks, hold the promise of greatly boosting efficiencies in a client/server world.

But those little software programs possess the potential to wreak havoc on the network unless they are properly managed. Why? Because agents — one of the most overhyped client/server technologies of the year — are, on their most basic level, akin to another small piece of code programmed to perform a specific background task: a virus.
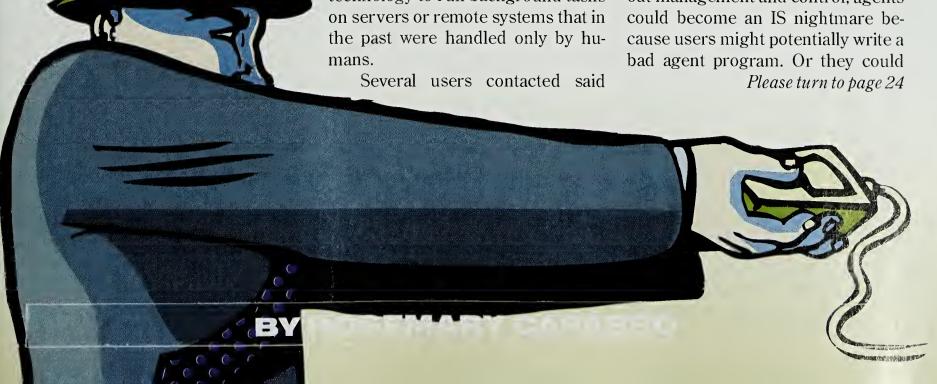
"Agent technology is a cunning technology," said Alan Boehme, senior product manager of the automated customer support division at DHL Worldwide Express, which recently completed a global package tracking system with agent technology. "The myth is that agents can think for themselves. They can be trained to do a number of functions, but don't expect them to reason at this point in time."

Agents, however, have big potential when it comes to providing a more cost-effective means of running distributed applications and managing networks of far-flung equipment. Many agent pioneers are using the technology to run background tasks on servers or remote systems that in the past were handled only by humans.

Several users contacted said they are not yet replacing people with agents, but they are finding that they can shift routine tasks to agents, leaving humans free to tackle more complex jobs.

"One of the keys to client/server is bias services," said Joseph Correira, a second vice president in the information systems department at The Travelers Cos. in Hartford, Conn., which is deploying agent technology. "The ability to run tasks in the background on your behalf is part and parcel to the new client/server design."

The challenge today, observers said, is to figure out how to best implement agents so they boost productivity rather than create chaos. Without management and control, agents could become an IS nightmare because users might potentially write a bad agent program. Or they could

BY ROSEMARY CAFASSO

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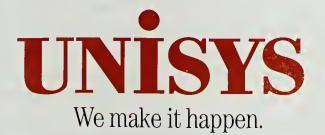
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populate a network with so many agents that they initiate conflicting procedures.

"The idea behind an agent is writing a program that will respond to changes in the system," said Richard Villars, director of network management research at International Data Corp. in Framingham, Mass. "So if you miscalculate or someone manipulates it, you could do a lot of damage really fast."

According to observers, users need to determine standard programming procedures and standard protocols to support and come up with policies as well as tools to oversee the agents.

To address this need, software providers are just beginning to roll out management tools. Legent Corp., for example, rolled out a suite of agent products for systems management in September that included components to set up an agent environment and keep tabs on them.

"While agent technology pro-vides great promise, it raises the issue of how do you manage it," said Rob McGovern, vice president and general manager at Legent's Agent-works division.

"We envision a hierarchy of agents," he added. "What's needed is an intelligent domain agent. The big-boss agent can correlate events."

But until agent management issues are resolved and management tools have matured, users are proceeding with caution.

"We are following the sirens," Correira said of the agents trend. "We think there are places where it makes sense, and we are trying to use them."

Travelers has built agents into several client/server applications, Correira said. One client/server claims processing system that runs on IBM's OS/2 includes agents programmed in C++ that monitor the length of time claims are sitting in work queues.

Travelers created a color-coded system using a traffic light metaphor. As agents monitor claims, they assign a status to them. If a claim needs to be processed within a few days, it appears in green lettering. As the deadline approaches, the color changes to yellow and then red. According to Correira, the claim becomes a flashing red item in the work queue if the deadline is missed.

The idea behind the traffic light agents is to off-load the boring chore of monitoring claims from humans to the system and to help users prioritize their work.

TRYING IT OUT SLOWLY

United Grain Growers Ltd. in Winnepeg, Manitoba, has also checked out agent technology and sees its potential.

The company worked with some preliminary agent technology from Dun & Bradstreet Software and has hopes that future versions will bring

SECRET SERVICE AGENTS

Earnie Bullock, customer systems manager at Recognition International, Inc. in Dallas, didn't go on a hunt for agent technology earlier this year. He simply wanted to improve a host-based customer service dispatch system.

But Bullock came across Edify and selected its application development environment to automate pieces of the customer service and dispatch operation. The final design essentially created a client/server system, with the older dispatch system now functioning as a back-end database and core application.

The new client is actually an IBM OS/2 front end built with Edify that uses agents to interact with and update the back-end database as well as manage telephone calls from service engineers.

This new system has the capability to handle up to 600 calls a day with a staff of six dispatchers. Bullock estimated that he would have needed three times as many staff members to handle the 24-hour, seven-day-a-week service operation, which also handles inventory management, without the OS/2 client application.

Service calls are initially taken care of by the human dispatch-ers on terminals that are linked to the Unix back end. The dispatcher updates the call database on the host with the caller information.

The host dispatch software then monitors the database and maintains a file of service requests. The software also maintains another file of available service personnel, which it scans and then matches to the incoming service request.

From here, the OS/2 client takes over, and no additional human intervention from the service department is necessary. The application manages with agents that have been programmed to automatically dial telephone numbers to page service personnel.

An agent then retrieves information from the host database. That information is translated from text to speech to update the service engineer by telephone.

When a service engineer has completed the job, he contacts the dispatch system and again interacts only with the OS/2 application and agents. The agents retrieve the account status from the engineer via a series of telephone prompts. They then translate it to text and update the back-end database to close this particular job.

Users are finding that they can shift routine tasks to agents, leaving humans free to tackle more complex jobs.

productivity boosts, according to Keith Minaker, corporate comptroller.

Minaker said United Grain is still on an initial release of the D&B Software client/server financial applications, which were designed with some basic agent technology. Scheduled to upgrade to the latest D&B Software financials release early next year, he said he expects it to deliver more sophisticated agents.

"An accounting person shouldn't have to ask for all the invoices and then mentally check for only those greater than $5,000," Minaker said. "The system should do that. It should make jobs easier."

OFF-LOADING THE GRUNT WORK

DHL is another company using agents to off-load dull, repetitive work from users. It opted for Edify Corp.'s tool set, which allows users to build applications with agents, Boehme said.

The DHL Global tracking system uses host-based databases, including an Oracle Corp. relational database management system, that contain information on customers' packages. The Edify application sits on a server along with the Oracle database, but it essentially plays the role of client.

When a caller requests package information via a Touch-Tone telephone, the package number is submitted to Edify on the server, which translates the information into data. The Edify application then launches

an agent to perform the query against the back-end databases, seeking the package's status.

The application returns the query information to the caller as a voice response. If the package has a problem, the application automatically forwards the caller to a live customer service representative, who then discusses the problem with the caller.

Boehme said rather than cutting back on customer service staffers, DHL is shifting their job responsibilities. Workers are less frequently stuck with the task of querying the database and instead have more time to work with customers.

"The premise was to automate where people were adding limited or no value so we can improve overall standards," Boehme said. "Now we are looking for the customer service reps to answer the more difficult questions and interpret information

that only a human can interpret at this time."

On the system management front, almost any user who deploys probes on a network is technically using agents today, primarily to gather information on network conditions. Long term, agent technology could be a big boost to distributed systems management by providing remote monitoring, diagnostics and job initiations on remote servers, worksta-

tions and other equipment that is part of the client/server network.

Systems management software providers, including Legent, Computer Associates International, Inc., Hewlett-Packard Co. and IBM, all say they are working to provide smarter and more responsible agents that would not only monitor activity but also initiate corrective actions. Eventually, these agents could reduce the need for humans at remote locations.

Kathy Neuman, a partner at Price Waterhouse, is testing agent software from Legent for a customer and gives it a qualified thumbs-up.

The software is capable of allowing Neuman's team to monitor whether a given piece of equipment on the network is functioning. It also allows the team to distribute software releases and ensure version control, she added.

Like Neuman, most users can see agents' potential. But some say they plan to hold off until agents move out of the fad zone and into the comfort zone.

"Anything that can simplify the distributed applications environment would be good," said Mike O'Dea, supervisor of financial systems and Unix administration at Ameritech, Inc., which is exploring agent technology. "I want to see some evidence that [agents are] working. We are kind of bleeding edge, but I would not put something in that would compromise integrity at all." ∎

Cafasso is a Computerworld *senior editor, Client/Server Software.*

IQ TEST

Agents can take on different styles and personas

TYPE	TASK	COMMAND STRUCTURE
DUMB	Repetitive, simple	"Do This"
LEARNING	Repetitive, complex	"If ... Then"
INTELLIGENT	Repetitive, unique, simple, complex	"I Want ..."

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Get Your CICS from Client/Server?

Moving to IBM's distributed on-line transaction processing monitor is problematic, but early users say the pain is worthwhile

MEMC's Ed Wehner: IBM's CICS/6000 presented some initial hurdles, such as a 36-hour batch window

ED WEHNER HAS MOSTLY seen the good side of IBM's CICS/6000 transaction monitor since shifting his order and production management system to the RS/6000-based software in July.

Wehner's company, MEMC Electronic Materials, Inc. in St. Peters, Mo., is saving $80,000 per month in mainframe service bureau charges. The number of crashes has been within reason, and users are seeing 25% faster response times thanks to new TCP/IP networks at most of the company's eight plants. Scheduled downtime for batch runs and backup was cut from three hours a day — in the middle of the afternoon in the Pacific Rim — to 20 minutes.

Just as important, reports that once took 45 minutes to wind their way from the mainframe to users can now be delivered in about five minutes with CICS/6000, which sits on a database or application server and processes transactions that come in through PC clients or other servers that are set up as clients.

But getting there exposed Wehner to CICS/6000's not-so-good side. Try a 36-hour daily batch window on for size. That's what MEMC was facing when it started working with CICS/6000, said Wehner, manager of business information systems at the maker of silicon wafers.

As a result, MEMC had to rewrite its batch application and put on-line and batch processing into "a deadly embrace" where they run simultaneously on different RS/6000 servers and contend with each other for data, he added.

Running in contention freed MEMC — one of the

BY CRAIG STEDMAN

first companies in production with CICS/6000 — to reduce daily downtime to the 20 minutes it takes to back up data, Wehner said. But it took eight months to first re-engineer the batch code so that it looks only at data changed within a two-hour period, and then to develop locking modes and recovery capabilities to ensure that the data is not corrupted amidst the contention. That contributed to CICS/6000 being turned on close to a year behind schedule. "There are a lot of technical hurdles that anyone considering this will have to go through," Wehner said.

Jon Reitan, director of financial and credit systems at Lamonts Apparel, Inc. in Bellevue, Wash., found out the same thing. Lamonts, a West Coast fashion retailer that moved its sales auditing application to CICS/6000 last spring, had to unload batch data into a Btrieve Technologies, Inc. database to avoid bottlenecks and get mainframe CICS-like performance, Reitan said.

An August upgrade to CICS/6000 Version 1.1.1 improved performance, but Lamonts does not plan to unload the unloading approach for the time being, he added.

SPECIALTY SHOP

Lamonts Apparel, a primarily mainframe CICS shop, was one of the first customers to leap into the CICS/6000 pool. But the $250 million Bellevue, Wash., fashion retailer may do most of its client/server swimming in other waters.

Jon Reitan, director of financial and credit systems, said sales auditing may be the only application that Lamonts converts to CICS/6000. The company is looking more at buying packaged database applications for functions such as financials, purchasing and distribution, which are expected to come off the mainframe in the next two to three years.

"We'd probably rather have a relational database structure to make it easier to get at data," Reitan said. That should also provide "better tools than just sticking with your standard CICS environment. I can get more functionality and flexibility if I get something that can run on top of a database."

Lamonts will likely have to get outside help on the database projects, but that cost should fit within its budget, he added.

Dan Kuznetsky, a research manager at International Data Corp. in Framingham, Mass., agreed that databases with advanced features such as stored procedures and triggers can handle most client/server applications. Users can avoid the cost and added complexity of a transaction monitor "until they get to the largest, most complex applications with multiple databases," Kuznetsky said.

A transaction monitor can also slow down performance until the number of users on an application reaches 300 or so, after which a transaction monitor should help throughput, said Feisal Mosleh, distributed OLTP product manager at CICS/6000 licensee Hewlett-Packard.

Database-oriented applications are easy to develop thanks to tool vendors such as Powersoft Corp. and Gupta Corp., said Dave Hudson, director of market research at The Standish Group. By comparison, a lack of more robust client/server tools is "one of the real gating factors" limiting the use of transaction monitors.

But heavier-duty tools will start appearing in the next few months, and transaction monitors should eventually be greeted more warmly as client/server moves beyond "the easy stuff," Hudson added. But even then, The Standish Group expects monitors to be used only in about 25% of distributed transaction processing applications, he said.

Lamonts' Jon Reitan is sticking with a database plan for most of his client/server work

CULPABLE UNDERPINNING

The culprit, according to both Wehner and Reitan, is the Encina Structured File Server (SFS) software developed by Transarc Corp. and used as an underpinning for CICS/6000 by IBM, which took over full ownership of Transarc in August. SFS "is geared toward [on-line functions], and it's very good at that," Wehner said. "But if you want to read a file sequentially, it takes a long time."

Analysts said CICS/6000 also falls short of other Unix transaction monitors, such as Novell, Inc.'s Tuxedo and AT&T Global Information Solutions' Top End, in on-line performance — even after Version 1.1.1 shipped in the summer with two to three times better transaction-per-second throughput than the initial release that kicked off CICS/6000 in mid-1993.

The performance shortcomings are "something that everybody recognizes on the IBM side as well as our side," acknowledged Feisal Mosleh, distributed on-line transaction processor (OLTP) product manager at Hewlett-Packard Co., which has put CICS/6000 on its HP 9000 systems.

Dave Chapman, business development manager at IBM's software lab in Hursley Park, England, said performance "will improve over time as the product matures." Version 1.2 of CICS/6000 is due late this year or early next year, and analysts said they expect another doubling of its transaction rate. A new SFS release will be shipped at the same time.

IBM let it be known early on that

it was "concerned more with stability than speed" in the first versions of CICS/6000, and the software has indeed been fairly stable, Wehner said. However, he added that MEMC averages only one transaction every two seconds, "so we're not hitting this with huge loads of transactions all the time." And he described the Open Software Foundation's Distributed Computing Environment (DCE), which underlies both CICS/6000 and Encina, as "a very immature product."

"You get into a lot of new technology with DCE," agreed Bob Denison, Unix unit manager at Wausau Insurance Cos. in Wausau, Wis. "CICS/6000 would be a real nice match for us, but there are some DCE management tools that need to be out there and aren't yet." Wausau was a CICS/6000 beta site but put the project on hold to work on database-oriented client/server projects, Denison said.

Also holding CICS/6000 back is a lack of third-party development tools and layered applications, said Dave Hudson, director of market research at The Standish Group International, Inc. in Dennis, Mass. The combined weight of the shortcomings has put IBM "a year to 18 months behind where they should be" in getting CICS/6000 ready for widespread use, Hudson added.

IBM's Chapman said more than 1,000 CICS/6000 licenses should be sold by year's end, a total that Hudson deemed reasonable. But no more than 10 to 20 customers are in production, Chapman indicated, and analysts are not forecasting a rush to implement CICS/6000.

"There won't be many people trusting it for mature applications until 1996," said Roy Schulte, vice president of software management strategies at Gartner Group, Inc. in Stamford, Conn. He added that CICS/6000 can safely support only about 100 users now, which "is not very big for a TP monitor."

Not that either Reitan or Wehner is sorry about having welcomed CICS/6000 into their shops now that

it's up and running. Both said converting their on-line code was mostly straightforward. MEMC did it manually over a three-month period, while Lamonts contracted the work out through IBM.

Both said they expect client/server CICS to provide increased application flexibility and faster data access for users. Wehner has already cut his mainframe service bureau fees and expects a full return on investment by early next year.

Reitan said Lamonts will also be looking for savings after its mainframe outsourcing contract comes up for renewal in 1996, although for now the CICS/6000 investment is an added cost.

BUSINESS-CRITICAL DESIGNS

Lamonts' 15-user sales auditing application handles credit-card validation and tracks all purchases — "pretty mission-critical for a retailer," Reitan said. The move to CICS/6000 was done mainly to shave outsourcing costs while preserving the retailer's custom-developed auditing code; indeed, users are still working at 3270 terminals hooked into the RS/6000.

But Reitan said he does hope to get "softer benefits" such as faster development times and decreased maintenance requirements.

MEMC is relying on CICS/6000 to run all of its order entry, price quoting and production scheduling, a 2-million-line application used by 200 people altogether and about 50 at a time. The faster data access and reduced downtime made possible by CICS/6000 is helping reduce the amount of time it takes MEMC to provide firm delivery schedules to users, Wehner said.

Despite the batch hassles, "the fact that you're able to do the same job [as on a mainframe] is significant," he added. "The economic justification is there, and I can live with [the drawbacks]. Everybody here is still getting what they want." ▨

Stedman is Computerworld's *senior editor, Large Systems.*

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COMPUTERWORLD

CLIENT/SERVER
J O U R N A L

Tech Cures on Tobacco Road

Liggett integrates logistics planning, manufacturing and financial systems

BY ALAN ALPER

DESPERATE TIMES CALL FOR desperate measures.

That's how The Liggett Group, Inc. felt two years ago when the $650 million cigarette maker realized it lacked the technological wherewithal to effectively compete.

A recently completed enterprisewide client/server system integrating financial accounting, manufacturing, human resources and customer service is changing all that. It is enabling Liggett to accelerate decision-making by giving employees instant access to critical business data. A more flexible architecture may also enable Liggett to better respond to shifting business challenges, including the potential for stricter regulation of the tobacco industry.

Liggett's vulnerability rang clear in mid-1993 following deep price cuts by market leader Philip Morris Cos., which caused profit pressures to ripple across the industry. Liggett's low-cost, generic cigarette strategy was under attack.

The firm's information technology infrastructure, meanwhile, had atrophied. The business ran via disconnected applications on an IBM ES/9000 mainframe and an AS/400 minicomputer. End users in customer service, for example, couldn't access inventory data owned by the sales organization, noted Ralph Mayes, who was hired in 1992 as chief information officer.

Mayes immediately tapped Ernst & Young to help. The consul-tancy proposed an enterprisewide client/server architecture. "The approach was that Ralph and Ernst & Young were building a new company," recalled Gary Baldwin, the Ernst & Young partner assigned to the project. "We were asked to find the technology needed and then bring the organization to the new company."

The project is slated to be completed by the end of this year, some 18 months after work began. Key objectives include the following:

● Re-engineer the business with unmodified software packages, which were thought to be faster, easier and less costly to implement and support.

● Contract implementation and project management expertise while retooling a cost-reduced information systems organization to support client/server.

● Complete the initial phase of the project to coincide with the expiration of Liggett's mainframe lease.

The technical solution: three Unix-based Hewlett-Packard Co. HP 9000 servers running Oracle Corp. financial and manufacturing applications; an OS/2 server running PeopleSoft, Inc.'s human resource package; and enterprisewide electronic mail. All end users were given Intel Corp. I486 and/or Pentium-based Windows PCs connected to the servers over a TCP/IP network.

So far, the $3 million project has stayed on schedule and is expected to pay for itself within two years, Mayes said. End users are already seeing a difference.

"We used to issue our monthly financial closing statement one month after the period closed. It now takes us 15 days," said Sam Veasey, director of corporate accounting. Veasey said he also likes the immediacy of the new system's on-line query and report generation. "We were never able to look at [specific] customer profitability; we can do that now."

Manufacturing, however, has not gone as smoothly. "Getting people to adapt to the new processes has been difficult," noted Timothy Jackson, director of operations planning. However, he hopes that having a single database to track how much finished goods inventory is available as well as how much tobacco is in the pipeline and in the factory will ultimately pay dividends.

Liggett expects re-engineered processes and systems to sustain the business, even though it's operating with 150 fewer people than last year. For example, the IS department was cut from 60 to 25 staffers in two years.

In fact, Mayes left Liggett recently to join Unifi, Inc., a Greensboro, N.C., textile maker. "I came to Liggett with a mission and completed it," he said. ◪

Alper is the editor of Computerworld Client/Server Journal.

One-Stop Shopping

Is single-vendor client/server viable? According to some users, it's a simpler and faster way to distributed computing nirvana.

SINCE THE BEGINNING — A SCANT FEW YEARS AGO — CONSTRUCTING CLIENT/SERVER SYSTEMS has been similar to building an edifice using incompatible children's blocks. It is possible, for example, to connect Lego and Duplo pieces, but only if you force-fit them together with a hammer and Scotch tape. Similarly, information systems professionals have managed to snap together multivendor, heterogeneous client/server components by writing their own middleware, which acts as systems cement, to create a sometimes cohesive, sometimes coherent, serviceable architecture.

But the "do-it-yourself" approach to mixing and matching client/server components is now being reexamined by organizations seeking a simpler and faster way to distributed computing nirvana. And why not? "Rolling your own" client/server is exceedingly difficult to master. That's because standards such as common application programming interfaces and network protocols are nonexistent.

As a result, some shops are evaluating single-source vendors that act as system integrators, much like leading players Andersen Consulting in Chicago, SHL Systemhouse, Inc. in Ottawa or client/server boutique Business Systems Group in Houston. The vendors-turned-integrators are offering to plan, acquire, integrate and install systems. Some will also manage client/server systems under contract. The vendors act as project manager or prime contractor and take full responsibility for dealing with subcontractors.
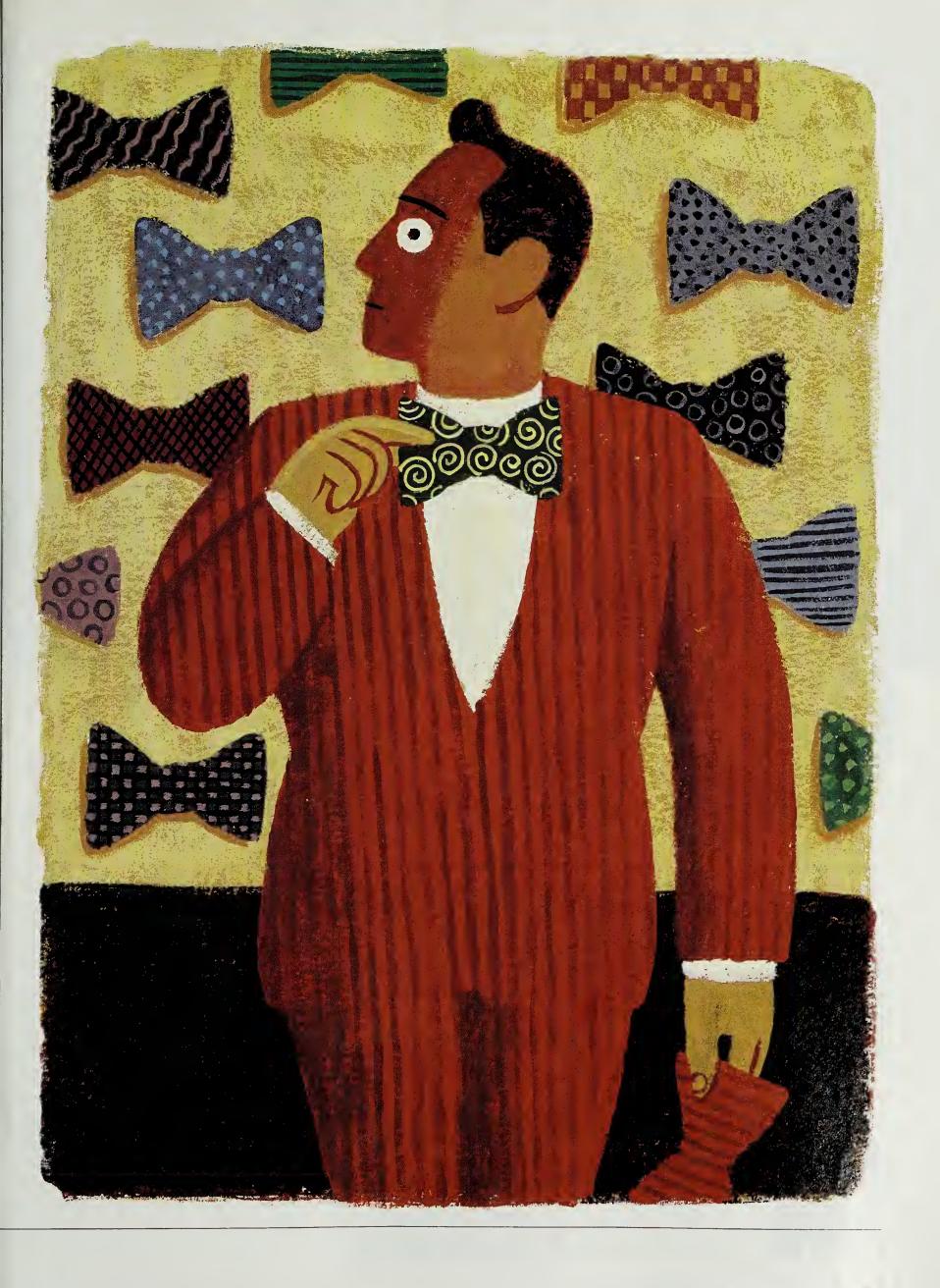
Hewlett-Packard Co. and Sun Microsystems, Inc., flexing new systems integration muscle, have offered this kind of service for the past two years; IBM's been at it for one year. Other vendors, such as AT&T Corp., Digital Equipment Corp. and Unisys Corp., have also joined the fray.

"In the mid-1980s, you used to deal with one to five vendors. Now you deal with more than 50 vendors, and by the end of the decade you'll be dealing with 500 vendors" for client/server components ranging from workstations to videoconferencing, said Burt Rubenstein, vice president of technology services at Cambridge Technology Partners, a systems integrator in Cambridge, Mass. "It's getting tougher and tougher to do it yourself."

Single-vendor client/server is the wave of the future, according to Judith Hurwitz, president of Hurwitz Consulting Group in Watertown, Mass. "It will be the way that people will be able to really implement client/server, especially organizations that lack a big staff of internal experts."

But for customers, the trend toward us-

BY STEVE ALEXANDER

SINGLE SOFTWARE ACT

Some software vendors are trying to get into the single-source act themselves. For example, Intersolv, Inc. in Rockville, Md., is fueling the single-vendor fire by trying to get customers to standardize on its client/server software development tools.

"We're mitigating the risk of single-vendor client/server by offering interoperable client/server software," said Kevin Burns, Intersolv president and chief executive officer.

Software provided by a single vendor, he said, is more apt to adhere to the same graphical user interface and application programming interface specifications, theoretically making it easier for the programmer to build more tightly integrated applications.

However, users have to be very careful, observers said. Innumerable vendors are pushing cross-platform, object-oriented, rapid application development tools. Standardizing on a particular approach could end in disaster if the particular vendor goes ▶

ing single-source providers for client/server has the potential for trouble. Leaving the planning and implementation to a single vendor could lock the customer into a proprietary solution — the very problem companies often turn to client/server systems to avoid.

While single-source client/server vendors virtually never provide an entire system based on a single company's products, the potential for lock-in involves not only specific products but also the way they are implemented, said John R. Logan, executive vice president of Boston-based Aberdeen Group.

If client/server components are too tightly coupled, it may be difficult to replace portions of the system with newer technology. "You are at the mercy of the person who designs the modules" for a client/server system, Logan said. "You can become locked in, and it has happened many times."

Yet, according to some users who have adopted the single-source approach, it works well, provided you take a few precautions.

Mike Frow, vice president of U.S. corporate banking at the Bank of Montreal in Chicago, said his firm did not want to become locked in by using a single source and, as a result, took a stern approach with Digital. "We've made it very clear that we were not interested in a proprietary product. Anything that came in had to be standards-based. And [as a result], a lot of products Digital brought in were not their own," he said.

Ed Odmark, senior vice president of finance and treasurer at America's Favorite Chicken Co., the Atlanta-based owner of Church's Chicken and Popeye's Chicken & Biscuits restaurants, said his firm avoided being locked in by withholding new technology upgrades from its 10-year, $110 million integration and systems management contract with IBM.

"If new client/server technology comes out in four to six years, we want to upgrade to that through another competitive process," Odmark said.

But despite user fears of being locked in by single-source client/server, Hurwitz said she sees no return to the days of proprietary vendors fighting for strict control of an account. "Sure, vendors love strict account control. I just don't see users wanting it. Yes, users want vendor support, but I don't see

them getting less paranoid about getting locked in. No one wants to go back to that."

Single-source vendors concede there's a risk that the practice will lock customers in to a particular supplier. But they say the risk is minimal and that most customers are willing to accept it in exchange for the guarantee that a single expert vendor/integrator will be available to handle a complex client/server project. What's more, they argue that some proprietary flavor is inevitable because of the absence of rigorous interoperability standards.

"Most client/server solutions today have proprietary content because they have to," said Michael Sinneck, vice president of applications solutions consulting at IBM Consulting Group in Somers, N.Y. "The industry wants to move toward open solutions, but we're a ways away from it yet. The question is, how much proprietary content will you put up with from your vendor? You have to police that."

Some disagree. Bill Coleman, vice president and general manager at Sun Integration Services, a Menlo Park, Calif., unit of Sun Microsystems, said the rise of single-vendor solutions doesn't mean client/server systems will begin to look like proprietary solutions. "We're all using the same Tinkertoys to assemble this thing," he said.

Despite a glaring lack of standards, vendors are seeking to create seamless interoperability for third parties and customers. IBM's Open Blueprint — a guide to client/server interoperability standards that the company is embracing — should provide insight into how to build IBM-compliant client/server systems. IBM is also developing starter kits, or frameworks with which to build client/server applications.

Sun, in contrast, offers Sun Enterprise Toolset — migration software and services for moving from mainframes to client/server.

And HP is offering consulting services, such as its Open Data Center Program, to help customers make the transition from mainframes to client/server. Its network and systems management service manages client/server systems for customers after they're built.

Vendors claim the single-source arrangement doesn't lessen the accountability of other vendors, which in essence work for the

single-source vendor/integrator. "The customer is more protected because HP is taking ownership of the solution," said John Ainsworth, marketing manager for HP's professional services in Cupertino, Calif.

"There is no lessening of vendor accountability," said Martin Clague, IBM's general manager for worldwide client/server computing in White Plains, N.Y. "You hold IBM accountable for relationships with software vendors."

For example, using Cambridge Technology Partners as its single-source vendor/integrator eliminated fingerpointing among about 50 vendors and provided a single point of contact, said D. Michael Cleary, chief information officer at the Michigan Department of Transportation in Lansing, Mich. "By going single vendor, I could say, 'I brought you in to make this work, so make it work.'"

If accountability is not an issue, which companies would be more apt to tap a single client/server vendor? The firms that have been running mainframes or minicomputers for years and are accustomed to extensive support services, according to Sun's Coleman. When they move to client/server, they want one vendor to provide the same kind of help.

Others believe the single-source client/server method will become increasingly popular among smaller, less technically astute companies.

Joseph Correira, vice president of applied technology at The Travelers Cos. in Hartford, Conn., said his company, which has 2,000 programmers, is large enough to do its own client/server integration and doesn't need a single-source vendor.

Correira's ultimate suggestion to users: Create a blueprint of the client/server system you want and make sure your single-source vendor sticks to it. "You would not want to give away the architectural control." ◪

Alexander is a Minneapolis-based journalist who reports on technology.

belly-up.

Standardizing on Intersolv made life easier, said Tom Cocchiarella, director of systems development at Deluxe Corp., a Shoreview, Minn., printer of financial and business forms.

"Technology is accelerating at a logarithmic rate, and it's difficult to stay up with all the changes and monitor who all the vendors are this month," he said.

ILLUMINATING

Amerisure distributes processing and risk

I N THE END HE REALLY HAD TO DEPEND ON FAITH AND TRUST.

As point man on Amerisure Cos.' most important information systems ever, Frank Petersmark had to sculpt an entirely new client/server strategy for the firm's commercial underwriting line of business.

Unfortunately, he had few human and technical resources to start: five support people, all of whom had only mainframe experience, and an aging mainframe system. "I was under budget constraints like a lot of other people, so I couldn't just go out and hire 10 people. I had to scavenge from other departments, not just information technology," said Petersmark, Amerisure's 36-year-old technical services manager.

That's because the $500 million Southfield, Mich., regional insurance company was — like many of its brethren — reeling from the sagging real estate market and low interest rates, which served to decrease investment income. This was causing the company to reduce head count and slash expenses. Amerisure sorely needed new systems to generate incremental revenue, cut costs and bolster flattening profits.

Three years later, Petersmark's 100-person team, drawn from various nooks and crannies of the company, is putting the finishing touches on a distributed system that pushes much of Amerisure's business processes off the mainframe and onto servers and desktop systems. Client/server has allowed Amerisure to re-engineer its business processes, enabling sales agents to spend more time servicing existing customers and pursuing new opportunities.

The new system has brought Amerisure from the trailing edge to well, maybe not the bleeding edge but certainly "out there where it hurts a little," Petersmark said.

However, the way the company did business before the new system hurt more than a little. With most of the company's mission-critical data on the mainframe, updating existing business was a slow and inefficient process. "The good old mainframe was only doing half the job," conceded Ken Gable, senior systems programmer. "It would do our new business well, but when you wanted to make a change in an existing policy, it had to be keyed in manually. All our ratings were done that way."

At the new system's heart is a third-party desktop insurance rating and policy processing package called Generate. Amerisure's information systems group

AMERISURE COS.

Mission:
Property, casualty and commercial insurance

Fiscal 1994 Revenue:
$500 million

Fiscal 1994 Net Profit:
NA ($20 million in 1993)

Annual IS Expenditures:
Approximately $10 million, 30% of which is spent on client/server projects

Employees:
1,300; 100 in IS

Offices:
12 large regional offices and three small branch offices

Software:
Standardized on IBM OS/2, Microsoft Corp.'s Excel and PowerPoint, WordPerfect Corp.'s WordPerfect and Software Publishing Corp.'s Harvard Graphics; mix of homegrown and packaged applications for policy generation

Hardware:
IBM 3090 400-E mainframe, 500 3270 terminals and 800 PCs

Wide-Area Network:
Low-end, frame-relay public exchange technology handles SNA traffic

BY ED SCANNELL

the WAY

Amerisure's Ken Gable, senior systems programmer (left), and Kris Gaulin, technical services supervisor (center), had a stake in the faith and trust business, along with technical services manager, Frank Petersmark (right)

built its own suite of applications to work with Generate using Easel Corp.'s Enfin object-oriented tools. The suite, called the Client Management System, has workflow capabilities and provides access to local databases such as financial information from The Dun & Bradstreet Corp.

This combination has allowed the company to better track the status of transactions, provide more data to agents, who can now more quickly turn business around, and better forecast new business.

"We have restructured so we can combine marketing and underwriting into one job," said Patricia Woody, Amerisure's vice president of commercial operations.

While the new system and the re-engineered business processes appear to position Amerisure to be more profitable and competitive in the future, Petersmark admitted the three-year odyssey was more time-consuming and expensive than he'd expected. "All the hidden time and costs of client/server you read about — they aren't hidden to us now," he said. "When we started this, we thought it would take us 18 months. It has taken three years and counting."

Petersmark's success has involved more than faith in a vision and trust in the band of workers he has brought together. It has also involved faith that the IBM sales team working with Amerisure would stop living in the 1970s and leap into the '90s.

In 1991, Amerisure was leasing a single IBM mainframe and had only a handful of rapidly aging IBM PCs in the field, no LANs and only a few wide-area network connections. Sales agents requesting a quote for customers on a policy might have to wait days for the information. And if they closed a deal, they might have to wait weeks for the final policy.
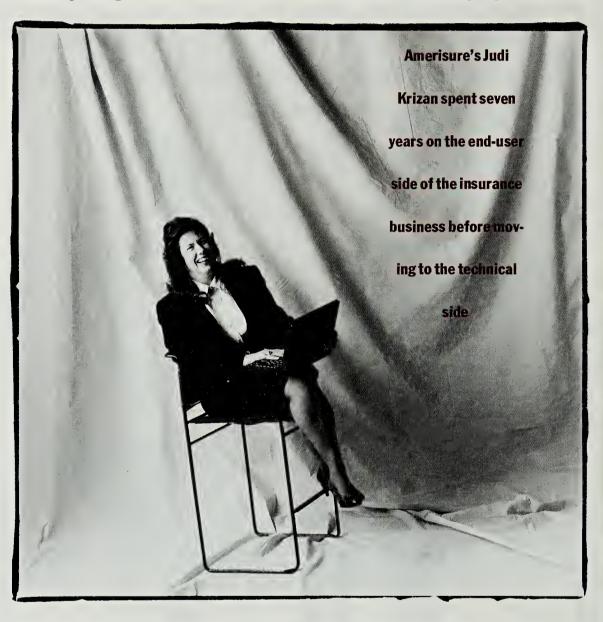
But 1991 was a bad time to get IBM marketing representatives to listen seriously to anyone wanting to move anything off a mainframe to a client/server system. "We were IBM's worst nightmare in that we were leasing our mainframe and had no new development going on. IBM was our nightmare in that they just wanted to sell us new big boxes and weren't listening to us about where we wanted to go," Petersmark said.

While Amerisure haggled with IBM, Petersmark purchased Generate, a popular, off-the-shelf, DOS-based package that allowed field

Amerisure's Judi Krizan spent seven years on the end-user side of the insurance business before moving to the technical side

agents to do everything from rating insurance policies to printing out the final policy right on the spot with a Hewlett-Packard Co. printer. The package reduced from weeks to a day or two the time it took agents to do certain tasks.
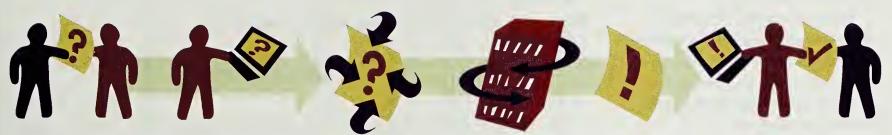
But Petersmark knew he had to build a technical infrastructure that would accommodate the evolving client/server strategy. He realized that to do this, his department would have to take on the role of systems integrator, something his staff had little experience doing. This put added pressure on Petersmark to select the right combination of people and products that would work together.

"One advantage we had was that we were all starting from scratch on this. We also had a forward-thinking CIO in Jeff Page, who was willing to listen to my ideas about how the department should be organized," he said.

One of those forward-thinking ideas was to recruit people who had only line-of-business skills but seemed to have a technical bent. As a five-year veteran of the company, Petersmark had come to know more than a few people from the insurance side that were unhappy because they were either underutilized or being downsized out of a job.

One of those workers with hidden technical talents is Judi Krizan, now a senior systems programmer. Krizan spent seven years on the insurance side of the business before she moved over to the technical side of the house. "My experience in the business units has given me better in-

ANATOMY OF A POLICY

Amerisure's new client/server system now does in a day what it used to take at least five days to do with the company's traditional terminal-to-mainframe system. Not only does it turn business around significantly faster, but it allows the company to better track transactions through the pipeline and more accurately forecast future business.

An agent receives a request from customers or potential customers for quotes on the cost of various insurance policies. The agent generates a request to the mainframe through a DOS-based program called Generate.

Generate is a server-based, soup-to-nuts insurance program that does everything from making requests for quotes on policies to printing out the final policy. The agent inputs this data into Generate and sends it off to an IBM 3090 mainframe.

The request is intercepted by the Client Management System (CMS), which enriches the request with more specific information from various data sources. CMS essentially tracks transactions through the pipeline.

Once the mainframe receives the request, it edits the new information against information it already has in its CICS database to see if there is duplicate information such as type of business, number of employees, financial information, etc.

The mainframe sends back the request containing the updated information to the local server where the agent can access it through his PC. The agent can then either print or fax the new information to the customer.

If the quote is approved by the customer, the agent can include the new information in a policy on the spot. Agents can also market this information to other potential clients.

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sight into what users do day to day. I have a better viewpoint on better matching technology with what they need to do," Krizan said.

Still, there were team members with years of mainframe experience who were apprehensive about working on projects where so much emphasis was placed on microcomputer-based tools, applications and networks.

But the team put technical differences aside and developed in the last 18 months or so a series of systems management tools to centrally deliver, configure and monitor data from a combination of third-party and customized applications. "Products like Hermes and IBM's [Configuration, Installation and Delivery] were not robust enough for us. So we use a little of this and write some ourselves because there is no one tool that does the job," Krizan said. "We have taken tremendous advantage of IBM's APPC to do most of this."

With the department reorganized, Petersmark and his team began to put the first girders of the infrastructure in place.

One of the team's first decisions was to standardize around IBM's Token Ring networks because Petersmark could leverage the experience a few department members had with the technology. He also knew that the existing T1 line and SNA network, which handled communications between the mainframe and hundreds of 3270 terminals, was merely a secondary road and not the four-lane highway needed to handle the new system's traffic.

WilTel, Inc. was tapped to provide a faster wide-area communications infrastructure, and a variety of routers and intelligent hubs were installed to steer and segment the expected increase in network traffic.

But as the firm stitched together a networking infrastructure, it decided Generate had too many technical limitations. Because it is DOS-based, Generate was unable to take full advantage of the company's existing mainframe processing, something the company had sunk considerable investment in. The idea was to create

a master/slave relationship, with the mainframe remaining the master.

Again with nothing on the market that satisfied their needs, Petersmark's team began developing its own middleware product using Enfin's programming tools. It built a front end to the customized suite that could intercept a Generate transaction and transfer it to the mainframe, where it would be edited against mainframe data such as basic policy information and then sent back to the PC where it had originated.

Meanwhile, the team considered giving users more sophisticated applications and communications packages that would work with Generate. To do this, they needed a multitasking desktop operating system — and that was not DOS or Windows.

So in late 1991, Amerisure began evaluating betas of OS/2 2.0 and liked its true 32-bit, graphical programming model, which speeds development time and results in more capable applications. More important, it could simultaneously and reliably run multiple 3270 and Windows ap-

A FEW REGRETS

With most of the hard work done, technical services head Frank Petersmark admits he would have done a few things differently.

Perhaps foremost, he said he believes the company should have allotted more time between when it figured out how to re-engineer its business processes and when it started developing the client/server system.

"We sort of did it hand in hand, which may not have been the most efficient way," Petersmark said. "We made technology decisions before we were through with workflow processes — decisions which got us in some trouble. This is part of the reason it's taken us three years instead of 18 months."

From a technical perspective, he said he wishes he had fought harder to persuade management to go with IBM's LAN Server instead of Novell's NetWare 3.x running many of the company's servers. With OS/2 on most desktops, Petersmark had to use the NetWare Requester for OS/2 for desktop-to-server communications, which proved to be a nightmare because the product didn't work initially.

"It eventually all got worked out, but much more staff time [was spent] than I wanted supporting the OS/2/NetWare relationship," Petersmark said.

His third regret, a common one, is that he did not better anticipate the amount of time and money needed to retrain his technical people in some of the microcomputer-based tools.

"We totally underestimated the time it would take to speed [technical] people up on things like switching from Cobol to Smalltalk or REXX. If I had known, we would have extended our project plans and budgets better," Petersmark said.

He also underestimated the time it would take for agents in the field, who had never used a PC before, to become acclimated.

Still, that added time and money may be put to good use as the company applies these lessons to future projects, Petersmark said.

plication sessions.

To make the transition a little easier, the IS group customized OS/2's Workplace Shell interface to make it safer and less intimidating.

"Our customized desktop doesn't have an OS/2 folder on it. They have a group of four icons for 3270 sessions, a log-in icon that flips over to a log-out icon and an icon for productivity apps they have access to," Gable said.

Because the team wrote a lot of customized code into Generate to accommodate Amerisure's rating forms and processes, it began collecting and generating more data than anticipated. Consequently, the company's dozen or so branch offices were running out of space to store data and began looking at new database servers.

Petersmark and his team began looking at market leaders such as Sybase, Inc. and liked what they saw technically. What they did not like was the $200,000 price tag for most offerings. IBM gave Petersmark an offer he could not refuse: DB2/2 for free.

As the IS group rolled out DB2/2, its biggest problem was how to manage multiple distributed databases from a central location. The answer came with CompuWare's Remote Control 2, which allows the IS group to schedule specific jobs for each database and track new users. It also provides solid security.

And security is one issue IS would like to better iron out. The company has a number of security schemes that Krizan describes as a mishmash. The company's central

security package resides on its mainframe.

However, there are three other security packages built into OS/2 on the desktop, Novell, Inc.'s NetWare 3.x on the departmental server and yet another on the DB2/2 databases.

Each time Amerisure gains an employee, IS must grant him three different accesses to get at data on the mainframe, LAN and database.

Cost savings is another issue. At the project's inception, Amerisure managers harbored no illusions about saving money. In fact, they did not expect to even recoup their front-end investments for some years to come.

"We went to management and said, 'Don't look to save money on the first iteration of this, but maybe we will have substantial development cost savings by the third or fourth,'" Petersmark said.

With the project not quite complete, Amerisure has yet to do any comprehensive cost savings study. But the company already knows it has saved workers "tremendous amounts of time" from an insurance processing standpoint.

The project has also made Amerisure's programmers substantially more productive. They completed the first version of its Client Management System in about a year. The second version took only three months. If Amerisure were to do a third update, it would take only 30 days.

"In general, what we have saved can be measured not in minutes but days and months," Petersmark said.

> **AMERISURE SORELY NEEDED NEW SYSTEMS TO GENERATE INCREMENTAL REVENUE, CUT COSTS AND BOLSTER FLATTENING PROFITS.**

STUCK

IN THE

MIDDLE

RPC, message queuing glue slowly congeals

CLIENT/SERVER MIDDLEWARE has grown from infancy to adolescence in the past few years, gaining multi-denominational converts along the way. These zealots are spreading the word that such tools work and can ease the cost and pain of developing distributed applications that operate across heterogeneous systems.
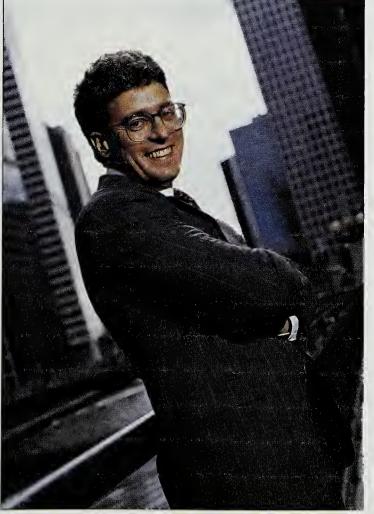
Chemical Bank in New York, for example, is following the gospel. The money center bank is piloting products based on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) as a potential foundation for the next phase of its computing strategy.

The OSF standard is "one of the more promising ways to integrate diverse platforms" at Chemical, including IBM and Digital Equipment Corp. hosts and a variety of PC servers, said Joe Pocchia, an executive vice president at the bank.

Chemical hopes some form of middleware will help it achieve its goal — familiar to many corporate information systems managers — of enabling the user to access or send information without knowing "that it's on a different platform, or necessarily where it is," Pocchia said.

Middleware tools, roughly divided into remote procedure call (RPC)-based and message-oriented categories, accomplish this by performing two important tasks: They buffer developers from the incompatibilities and intricacies of underlying system and networking environments, and they provide services to link client applications to the resources they want and interact with other systems reliably and efficiently.

Chemical, for example, is looking at middleware to support real-time updates of host-based customer account files. Currently, transactions coming in from automated teller machines and bank tellers are collected and then batched overnight to hosts. Real-time updates would enable the bank to provide its users and customers with up-to-the-minute account status.

For The Travelers Corp., "the dream" of middleware is a distributed computing model where clients can freely access servers optimized for particular applications, such as imaging, database queries and heavy-duty calculating, said Joseph Correira, vice president of applied technology at the Hartford, Conn.-based insurance firm. "And in a real nirvana world, if a task is running slow, you can start another session" on another server.

However, Travelers is one of several companies sitting on the sidelines waiting for mid-

Chicago Mercantile's Steve Goldman is implementing middleware in the form of IBM's Message Queue Series

BY ELISABETH HORWITT

The concept of an all~seeing, all~powerful being is not a particularly appealing one. *Unless, of course, you happen to be that being.*
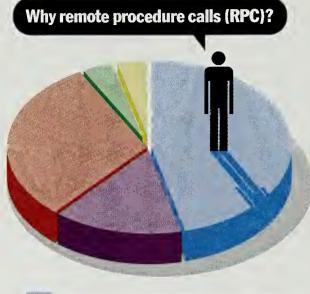
Then it becomes quite the appealing concept, indeed. And it makes Datura SQL Spy™ quite the attractive investment. Because SQL Spy is the only Windows™-based tool that allows you to monitor ORACLE™, Sybase SQL Server™, and Microsoft Advanced SQL Server™ databases at the same time. With a simple 10 minute installation and already included pre-defined events, SQL Spy lets you begin monitoring critical system events right out of the box. It also has unlimited customization capabilities so you have the power to define what events should occur when specific thresholds are met. For instance, you can use DDE to send e-mail to a workstation, or to deliver results to a spreadsheet. You can also log statistics to a file. Or beep a workstation. You can even send multiple signals at once. As if that weren't enough, SQL Spy is also the only monitor that records and plays back database events in real time – before, during, and after a crisis, even during a system shutdown. So you can evaluate events as they actually occurred to better analyze problems. All in all, it's quite a powerful monitoring tool. Which is good news for anyone who's feeling a little power hungry.

To order your copy of SQL Spy with a 30 day money back guarantee, just give us a call at 1.800.442.6861

DATURA *SQL Spy*

PLATINUM
TECHNOLOGY

Why remote procedure calls (RPC)?

24	Allows applications to be distributed across different systems
8	Wave of the future
16	A particular application required it
2	Cost-effective
2	Other
52	Survey base

dleware in general, and DCE in particular, to mature. The promise — which users say DCE has yet to fulfill — is a multivendor standard for directory, naming, reliability and security services that are key underpinnings to mission-critical applications.

Unfortunately, DCE is still not mature and broadly supported enough to allow heterogeneous systems to interoperate while using its underlying services. Also missing is a standardized DCE implementation that can support Windows clients without glutting their memory. The OSF is said to be preparing such a system for next year.

LESS TIME WITH MIDDLEWARE

Yet the lack of a mature DCE standard has not stopped many users from implementing middleware. Their reward has often been a major decline in programmer overtime.

Chicago Mercantile Exchange, for example, is using IBM's Message Queue (MQ) Series to enable some 75 to 80 clearinghouses to submit market transactions directly to its IBM hosts.

Using MQ, "I figure it will take about four weeks to code the communications piece of a production-grade application to process incoming trades and about four weeks for each service bureau" to implement the middleware, said Steve Goldman, manager of technical planning at the futures exchange. Without the mid-

RPCs show up primarily in enterprise applications ...

2	Workgroup
5	Departmental
10	Divisional
26	Enterprise
43	Survey base

... and are under consideration at one quarter of the shops surveyed.

27	Within 1 year
25	Within 2 years
12	Within 3 years
9	Within 5 years
69	Don't know
153	No intention
295	Survey base

ORB INTEGRATION

A next step for middleware that some users see as crucial is the integration of middleware tools with Object Request Broker (ORB) technology.

ORBs might be called "middleware for middleware" because they take care of underlying tasks associated with distributed computing, which most middleware products do not, to date, address.

ORBs route client application queries to the right object, which can be a database, peripheral or application service. They can also perform load-balancing and best-path routing in cases where more than one system has the desired resource, said Linda Fisher, an engineer at Pitney Bowes, Inc.'s mailing systems division.

The technology now runs on a variety of leading hosts as well as some message-oriented middleware. And a movement to integrate ORBs with RPC-based middleware is underfoot, a Hewlett-Packard Co. spokesman said.

However, ORBs lack interoperability. The Object Management Group's Common Object Request Broker Architecture (CORBA) has gained broad industry support as an interoperability standard, but it is not yet completed, Fisher said. Pitney Bowes hopes to begin a pilot of CORBA-based products next year.

dleware, "you'd be looking at an eight- to 10-week effort, coding the network layer yourself," he said.

And like all message-oriented middleware, the MQ Series supports asynchronous communications — that is, it manages interaction among multiple clients and servers through a system of queues where messages reside until the receiving system picks them up. This essentially means guaranteed delivery, even if a system crashes or a link goes down temporarily — a crucial feature for delivering futures transactions, Goldman said.

Indeed, guaranteed delivery is crucial for any company that needs its systems to interact with those of

business partners over less-than-reliable long-distance links.

Shared Medical Systems Corp. in Malvern, Pa., for example, has implemented Covia Technologies' Communications Integrator in a system that coordinates information flow among health care providers and insurance and financial companies.

"As I do an admission for a patient into a hospital, I may want during that process to do an eligibility inquiry to an insurance carrier to verify insurance exists and the terms," said Don Bechtel, manager of system development at the company. Communications Integrator performs not only the physical routing but also the logical routing, which determines where to look for the information or computing resource requested.

Unlike message-oriented middleware, however, RPC-based middleware lacks queuing functionality. This concerns some shops.

"The use of RPCs results in the coupling of distinct processors, so response time of one processor is dependent on throughput of another, so that your processor can't move onto the next piece of information or the next process until the other processor finishes its work and says it's done," Goldman explained.

Fortunately, RPC-based middleware vendors are addressing this drawback by providing asynchronous, multithreading capabilities that enable clients to go on to another task while they wait for the server to respond and allow servers to deal with more than one request at a time.

RPC NICHE

At the same time, RPC-based middleware addresses a niche of its own. "It is probably the only viable alternative for developing true distributed cooperative processing applications, where one piece is on one system, one on another," said Joe Schwartz, a consulting software engineer at Bankers Trust Co. in New York.

One use for RPC-based middleware at Bankers Trust is to set up dynamic links between clients and specialized servers so, for example, a trader workstation can off-load "compute-intensive applications," such as financial modeling, to an application server with heavy-duty CPU,

according to Schwartz.

One important breakthrough for those who find writing RPC calls a drag is a new breed of products that couple middleware programming to familiar, Windows-based tools such as Powersoft Corp.'s PowerBuilder and Microsoft Corp.'s Visual Basic.

Dow-United Technologies, for example, is using one such tool from Open Environment Corp. in Boston. The Wallingford, Conn., firm has several middleware-based mission-critical applications up and running, including one that collects labor by engineer and project, said Nick Brencivengo, IS manager.

Announced last August as Encompass, Open Environment's tool kit also supports asynchronous RPC communications through a server layer that uses preset rules, such as what type of information is needed for a given calculation, to determine where to route queries. Open Environment's tool kit eliminates the need to embed RPC-based links to specific servers in each application, Brencivengo said. ◪

Horwitt is Computerworld's *former senior editor, Networking.*

Why message-oriented middleware (MOM)?

30	To make information available to suppliers, customers
53	To interconnect users to a variety of servers
37	To distribute applications across various servers, clients and network protocols
4	Other
124	Survey base

MOM shows up primarily in enterprise settings ...

54	Enterprise
21	Departmental
19	Divisional
3	Workgroup
97	Survey base

Source: *Computerworld* Database Division

... and is under consideration at slightly less than one quarter of the shops surveyed.

23	Within 1 year
27	Within 2 years
8	Within 3 years
4	Within 5 years
135	No intention
60	Don't know
257	Survey base

Technology

Beyond RDBMS: PostRelational

Relational database management systems (RDBMS), once hailed as the culmination of database technology, don't always meet today's real world needs. In the search for business solutions, users want performance, customization, flexibility, portability, and efficiency, all in an open, client/server environment. An emerging technology, PostRelational database management systems, may be the solution for many of these users.

• Equifax, the nationwide credit reporting service, supports nearly 775 users on a Hewlett-Packard system using a PostRelational database management system. If the Atlanta-based firm had chosen a traditional RDBMS system, the company estimated it would have installed a new server for each 150 new users.

• Parceline, the next-day parcel delivery service company based in the United Kingdom, chose a PostRelational DBMS for its ease-of-use features. An immediate success with users, VMARK Software's PostRelational uniVerse product provided an added benefit — software costs were reduced by half in the company's distributed UNIX environment!

• Air Ontario, which originates more than 150 flights a day, deploys leading-edge technology to stay competitive in the hotly contested airline business. With the help of uniVerse, the Canadian airline downsized its computer system by migrating to a UNIX and Novell PC local-area network with expected savings of $500,000 in maintenance and capital expenditures over five years.

These organizations and hundreds like them face the task of finding effective and efficient solutions in an atmosphere clouded by spiraling costs, expanding information needs, and increased competition. Each of these companies first looked at traditional RDBMS technology, but after closely examining their own business and user needs, decided on a more advanced choice, a PostRelational database system.

PostRelational Technology

What is PostRelational technology? PostRelational database management systems combine features of traditional RDBMSs with additional storage, manipulation, and data retrieval features required by many business users. PostRelational technology offers a more efficient infrastructure for certain types of applications, such as analytical applications which handle large pieces of information. Due to its efficiencies and the fact it is less resource-intensive PostRelational technology enables user to utilize less expensive hardware, or put more users on a system. And larger numbers of users sharing a system mean achieving substantially higher performance at a lower cost.

According to John Morrell, research manager at International Data Corp (IDC), a research firm, "the difference between a relational and a PostRelational database is in how information is stored and indexed — everything else is the same."

Organizations automatically turn to relational databases without really examining the efficiencies they might gain elsewhere, says Morrell. "This can be especially true in client/server environments in which users are just beginning to sort through the issues. Once the analysis begins, many organizations will realize that PostRelational technology may better help them manage the large amounts of quickly changing information necessary to their business," Morrell predicts.

Relational databases are very operation-intensive because they operate like a large flat file to find and retrieve information. This is no problem in transaction applications, but RDBMSs must create temporary holding places or "joins" for analytical applications, which are very overhead-intensive.

VMARK's uniVerse, for instance, eliminates this overhead because its three-dimensional database structure relies on a dictionary-based file system, enabling developers to create data dictionaries that

THE WORLDWIDE UNIX RELATIONAL DATABASE ENGINE/SERVER SOFTWARE MARKET, 1992 AND 1993 (all figures, software licensing revenues, $M)					
	1992		1993		
	Licensing Revenue	Market Share	Licensing Revenue	Market Share	'92-'93 Growth
Oracle	305.0	43.9%	405.0	44.0%	32.8%
Sybase	93.0	13.4%	151.0	16.4%	62.4%
Informix	101.0	14.5%	125.0	13.6%	23.8%
Ingres	70.0	10.1%	73.0	7.9%	4.3%
Progress	20.0	2.9%	26.0	2.8%	30.0%
VMARK	14.0	2.0%	23.5	2.6%	67.9%
Unify	15.0	2.2%	15.0	1.6%	0.0%
Others	77.0	11.0%	101.5	11.1%	31.8%
Total	695.0	100.0%	920.0	100.0%	32.4%

Database Engine/Server software includes database server and connectivity products, and specifically excludes development tools and service revenues

Source: Preliminary IDC Market Estimates, 1994

Review

Database Technology

escribe the database structure, and define the relationships between the fields, records, or files. This ability to store definitions in separate dictionaries instead of in every record simplifies development and reduces application execution time. The dynamic file resizing function eliminates the need for constant file administration by automatically resizing files to grow or shrink as records are added or removed.

VMARK Software, Inc., the leading supplier of advanced RDBMSs used in conjunction with industry-standard open system operating environments, can accommodate 70 different UNIX systems from 20 different vendors, encompassing workstations, personal computers, minicomputers, supercomputers, and fault-tolerant systems. The uniVerse database also runs on Novell's UnixWare and will be released on Microsoft Corp.'s Windows NT in the first half of 1994. VMARK's uniVerse supports Structured Query Language (SQL) and the open database connect (ODBC), as well as providing desktop integration, graphical user interfaces (GUIs), and object-oriented programming.

VMARK, based in Framingham, MA, markets its products worldwide through more than 300 value-added resellers (VARs) which provide vertically oriented, packaged solutions for small-to-medium size companies, and for departmental solutions in large organizations. Competing against the traditional RDBMS vendors such as Oracle, Sybase and Ingres, VMARK's uniVerse offers a multidimensional PostRelational database structure that incorporates traditional RDBMS with easy-to-use, powerful, industry-standard systems that offer flexibility in developing, retrieving and storing data.

uniVerse, itself, provides:

• Integrated support for SQL and traditional query languages. SQL integration provides the developer with extensive system capabilities including client/server computing, transaction management, and distributed files across common operating platforms.

• Client/server architecture and products to access and operate with other relational and commercial databases across a wide range of computer systems.

• Complete networking, communications and distributed processing capabilities so that a variety of RDBMSs can be managed on a network; a former obstacle to successful client/server implementation.

• A range of 4GLs and industry-standard graphical user interfaces (GUIs).

• Compatibility with thousands of legacy applications on a variety of proprietary systems, enabling proprietary software users to move applications into a more cost-effective open environment.

Earlier this year, VMARK acquired Constellation Software, Inc., the developer of HyperSTAR, a family of object-oriented, client/server products which enables uniVerse to interoperate with Windows-based products, such as WordPerfect, Lotus 1-2-3, and Excel, as well as with commercial databases from Oracle, Sybase and Informix.

Founded in 1984, VMARK offers more than 1,000 commercial applications and has a customer base of nearly 14,000 licensed systems worldwide, representing nearly half a million users. Some of VMARK's users include Anheuser-Busch, Neiman Marcus, the N.Y. Public Library, Carolina Freight, Graceland, the Baseball Hall of Fame, the French Office of National Forestry, the London Underground, Hyatt International

Hotels, France Telecom, and the University of Southern California.

An Open Environment

Organizations need to avoid short-sighted solutions. An open environment is key and with that in mind VMARK is planning to offer even more options and open environments in the future. It has also enhanced its customer service with additional classroom training, and training and consulting services.

The strategy is working. Last year VMARK generated $6 million in service revenue and a 61% increase in revenue overall. (Total revenue for the company in 1992 was $18.8 million and topped $30 million in 1993.) Experiencing an impressive five years of revenue and profit growth, VMARK was recently listed in Business Week's top 100 hot growth companies. VMARK has also been selected by IBM as an IBM Business Partner and by Microsoft as an Authorized Solution Provider.

VMARK's international sales total 35% of revenue. The company offers a worldwide customer service organization with several support locations in the U.S., Europe, the Far East, and Australia. Consulting, customer migration and training services are also provided. VMARK also initiates direct sales efforts to industry segments, such as large commercial and government end-users.

Today, users may not be as familiar with PostRelational technology as they are with the traditional RDBMS, but VMARK believes that with its ability to offer a large base of vertical applications, as well as system efficiency, speed, response time, and service — all in an open-system, client/server environment — it's only a matter of time. ●

VMARK's strategy is working.

Duffield of Dreams

With nearly $100M in sales this year, PeopleSoft's CEO has lofty plans: He expects to overtake Oracle and SAP within two years

CSJ PeopleSoft captured the industry's imagination as a pure-play client/server company before there were any others. Do you get peeved when people say you're a distant third to Oracle and SAP?

DUFFIELD Not really. We couldn't handle any more business, frankly. Any more successful and we'd have customer service problems. And we have a different view of what client/server is.

CSJ How's it different?

DUFFIELD Well, Oracle customers will tell you that they're not really a client/server offering [CSJ, August]. That's coming from their customers, not from us. And SAP has employed a different architecture. They haven't fully exploited the PC.

CSJ How do you define your approach?

DUFFIELD A multitiered architecture. We can be single-tiered: We can operate our system on a stand-alone PC. We can operate it with, you know, the fat client, as they say, where there are a lot of things going on on the PC and the server is pretty much a response to SQL requests. And then we can operate in the three-tiered architecture, like SAP, where the application logic can reside on an application server, and the interactive logic would reside on the PC, and the database server would do its job responding to SQL requests.

CSJ A lot of your customers, though, have im-

plemented the two-tiered approach.

DUFFIELD We feel the two-tiered is optimal. The more things you have in a solution, the more things go wrong.

CSJ One of the criticisms of the two-tiered system is what you mentioned before, the fat client. That it slows down implementations and makes it more expensive than people had first thought.

DUFFIELD This question is implying that we're strictly a two-tiered architecture, but we're not. The customers have chosen that. We have the best implementations around. Some general ledger customers have gone into production in three weeks. And some have put payroll up in just three months. Oracle and SAP implementations — they are very slow and arduous [because of] the programmer-intensive nature of both their products.

CSJ Programmer-intensive?

DUFFIELD In Oracle, you write in SQL Forms 4.0 or even 3.0. In SAP, you write in Abap 4. Those are programming languages. In PeopleSoft, you point and click your way through your customizations. Now, the [PeopleTools] happen to be on the PC. And consequently, the modifications are enabled through the PC. Some go a bit nuts using the tools to change the system all around. However, we highly suggest they don't change much, if anything. Customize the critical requirements, then leave it alone.

BY KIM S. NASH
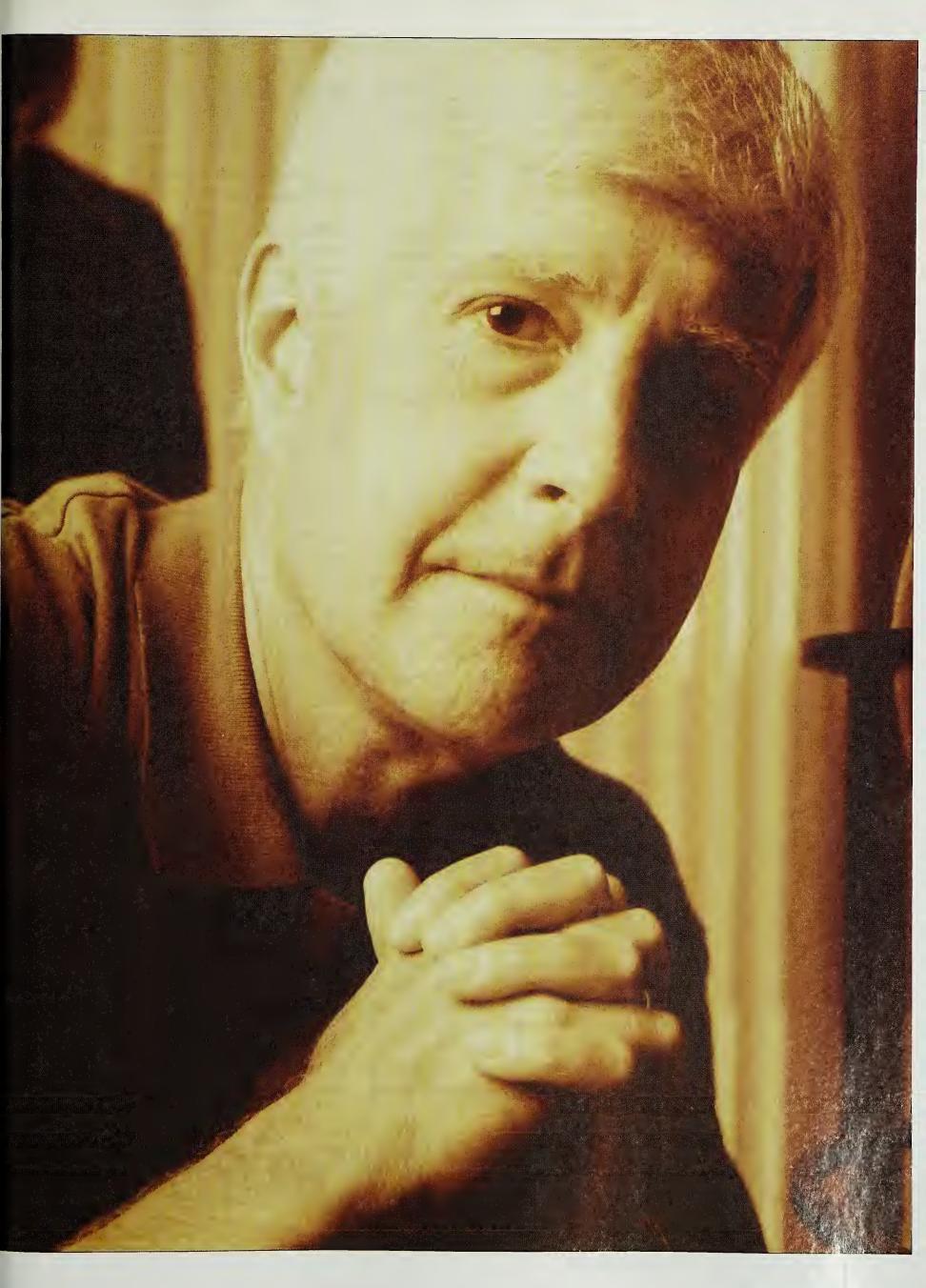
CSJ How much does an average, first-time implementation cost?

DUFFIELD People typically budget six to seven times their license fee.

CSJ Do you back away from bidding situations when you see that IS doesn't have top management buy-in? That's usually a big red flag indicating the project is likely to fall flat.

DUFFIELD We've been lucky that way. Invariably, there are some anomalies, and you don't realize there isn't that buy-in. You wrote about one in *Computerworld*: Tennessee Valley Authority [CW, June 6, 1993].

CSJ Yes. Big mess there.

DUFFIELD There wasn't top management backing there. I think there is today, and we'll hopefully recover. Where we tend to shy away from a prospective customer is when the [information technology] folks are at odds with the users about which vendor to choose. Some [information technology] people still prefer the glass-house, dumb-terminal applications.

CSJ When do you see PeopleSoft surpassing Oracle or Sybase in revenue for client/server applications?

DUFFIELD That's our mission statement, which is a big, hairy, audacious goal, as mission statements should be. To lead in financial and HR applications together. And we already lead them in HR. Tomorrow, we want to lead them both in financial systems.

CSJ How soon will you do it?

DUFFIELD By the end of 1996. We're growing at 100%, and that's a trick to keep that going without going supernova. We don't want to grow any faster than that or we'll lose control, much like Oracle did several years ago.

CSJ What are you doing to keep up in the area of customer support?

DUFFIELD Well, we've been growing at 100% for about four years now.

CSJ So it's old hat?

DUFFIELD It is. We're fortunate in that the [PeopleSoft] technology allows our people and our customers to learn it very quickly. It's not like a legacy system, where you have to learn a million-line Cobol program to figure out how to customize it. Consequently, the customers, too, can take on more responsibility than they could in the past. We can absorb more new customers more quickly than other vendors and still retain our high level of customer satisfaction. We're going to get better, too.

CSJ How?

DUFFIELD We finally have a quality initiative within the organization. We tested the bejesus out of our Release 4.0 product of HRMS. We never thoroughly tested every piece of the system before. Did the upgrade manager work from one version to the next? Does it work for DB2 as well as for Oracle, as well as for [Gupta Corp.'s] SQLBase? Every platform, every function, every component. It was drilled into us by our customer base that, "Hey, PeopleSoft, you're doing a good job, but you need to do a lot better job in the quality area."

CSJ Early this year, you talked about getting more vertical with human resources and accounting. What's going on there?

DUFFIELD By the end of this year, we're introducing government financials in a partnership with Andersen Consulting. Financial stuff with specific functions for the public sector. We also are targeting health care and higher education with either marketing programs or products. And we're not just going to deliver financial and HR; we're going to deliver their mission-critical systems. If we chose to specialize in utilities, we'd deliver a

Duffield says, 'We couldn't handle

customer information system, for example. We are also analyzing our ability to enter the manufacturing marketplace.

CSJ But there are already so many companies in manufacturing resource planning — why try?

DUFFIELD Companies like Coca-Cola or McDonnell Douglas, they're big manufacturing companies, right? If we're really going to be the enterprise solution provider, we probably should have a manufacturing product. And now is a good time to reinvent manufacturing.

CSJ Will you buy or build?

DUFFIELD We have 15 folks working on our manufacturing applications — mostly ex-ASK folks, the fellows that built the original Man-man product: Roger Bottarini and Chris Wong. They're bringing the functional knowledge of manufacturing, and we're going to instill the technical perspective into them.

CSJ Why keep quiet about it?

DUFFIELD We're skirting the issue right now, primarily for Wall Street. Wall Street says, "You guys couldn't finish your Sybase System 10 port [of Financials], and now you're going to get into manufacturing? Surrrre."

CSJ Where are you with a Sybase System 10 port?

DUFFIELD Our product runs on System 10, but it just runs too slow. We're working with Sybase to change their optimizer to accommodate the kinds of complex SQL that we've got in our product. Ours is like a decision support system, where you have to write complex SQL to make all that stuff happen. Sybase is committed to beefing up the optimizer to let the queries run a lot more quickly. They have 10 people working on it. I'm thrilled with the relationship we have with Sybase, and it was very rough a year and a half ago.

CSJ Do you think Windows NT will be as powerful a force as Unix is in getting people to move systems off the mainframe?

DUFFIELD Personally, I do. Microsoft has the right strategy: to be the supplier of the operating system and the database, both the client and server. To make that selection inexpensive — relatively — and easy. To have everything tie together nicely and reduce the decisions of the MIS person. Much like the IBM support of the past, where you had your mainframe and operating software from IBM, and it mostly worked together with relatively few headaches.

CSJ That's easier in some ways, but users lose freedom.

DUFFIELD I think users would willingly give up some freedom for a great reduction in complexity. I don't think there's an MIS manager out there who wants to spend 40 or 50 hours per week keeping things working together. I know I'd rather spend those hours building my mission-critical application. And yes, maybe it's not quite as open as I would dream, but I can get my job done.

CSJ Has client/server technology evolved the way you thought it would?

DUFFIELD We never imagined that People-Soft would grow as it did. We thought maybe we'd top out at 50 people. Today, the pipeline for HR business in North America is $90 million. For Financials, $35 million, and this is really our first year for accounting.

CSJ How will the market look a year from now?

DUFFIELD The market is shaking out some people. Problems with ASK on the applications side. Ross is in rough shape. Walker had a 15% staff reduction. Integral had a 30% staff reduction about a month ago. A lot of companies are struggling, but the three horses in the race aren't. ◪

DAVE DUFFIELD: 'WE'RE GROWING AT 100%, AND THAT'S A TRICK TO KEEP THAT GOING WITHOUT GOING SUPERNOVA'

Nash is Computerworld's *West Coast senior editor, Databases.*

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Source: Lotus Development Corp., Cambridge, Mass.

▲ **REACH OUT AND TOUCH:** AT&T-managed Lotus Notes services would permit organizations to establish bulletin boards for information sharing

DIGITAL BULLETIN BOARDS

Electronic Postings

W HEN A TORN SCREEN SHUT DOWN ONE OF ITS MECHANICAL SIFTING machines, the Domino's Pizza Distribution bulletin board opened up. Doug Keefe, the area maintenance support leader at the stricken commissary in Florida, knew that the screen manufacturer was history. So forget solving the problem with one phone call. But it was still time to reach out and touch someone.

"Doug posted an alert on our bulletin board to his counterparts at the other commissaries requesting help locating the screen," explained Laura Smith, manager of Domino's Pizza Distribution in Ann Arbor, Mich. "In a couple of hours, he'd gotten two phone calls from Minnesota referring him to an alternate supplier in Ohio."
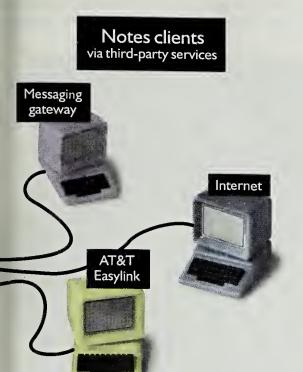
One phone call later, the replacement screen was on its way. The next morning the dough was rolling again, avoiding an instant epidemic of pepperoni withdrawal.

Previously, there were two chances — slim and none — of a replacement part arriving so quickly at the Florida commissary or at any of the other 25 company commissaries that supply 95% of the Domino's retail outlets with the food products used to make pizza. Finding a new part would have meant countless phone calls, flying the part to the appropriate site, at least two days' downtime and the human resources cost of shifting and double-timing other commissary employees.

BY WILLIE SCHATZ

ILLUSTRATIONS BY JOHN BAXTER/ACME DESIGN CO.
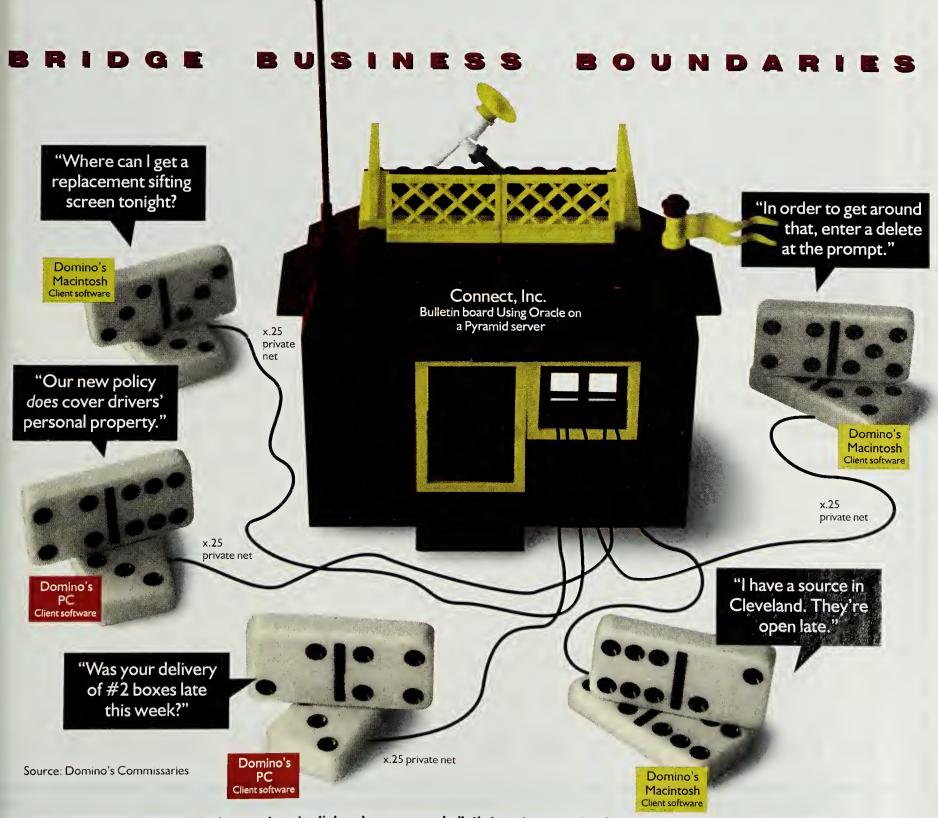
The client/server network, which Domino's leases from Connect, Inc. in Cupertino, Calif., has been customized as a virtual private network that communicates corporate information such as policy statements, product news and operational updates to all 1,100 distribution division employees. There's even a daily newsletter, "The Inside Scoop," that highlights new information with references to documents posted on forums.

Pizza isn't the only industry in which client/server bulletin boards are revolutionizing internal and external communications. Software and hardware developers, nonprofit information providers, educational networks and trade associations are just a few of the various groups leasing client/server bulletin boards from third-party service providers.

Client/server bulletin boards enable users to become more proactive
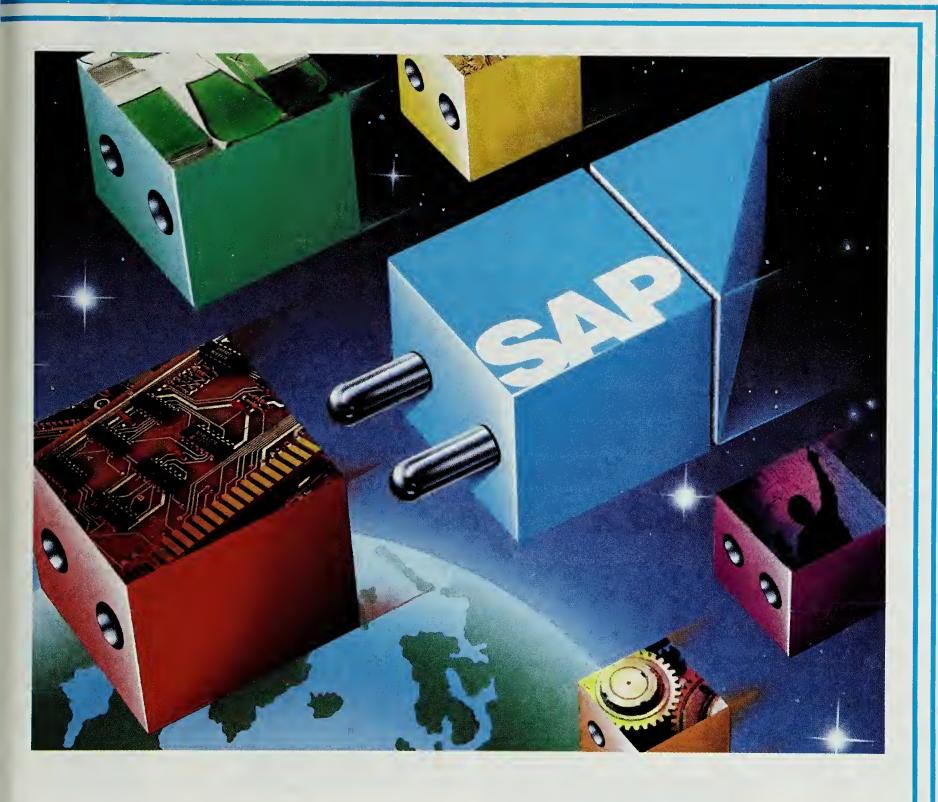
BRIDGE BUSINESS BOUNDARIES

Notes clients
via third-party services

Messaging gateway

Internet

AT&T Easylink

"Where can I get a replacement sifting screen tonight?"

Domino's Macintosh Client software

"In order to get around that, enter a delete at the prompt."

Connect, Inc.
Bulletin board Using Oracle on a Pyramid server

x.25 private net

"Our new policy *does* cover drivers' personal property."

Domino's Macintosh Client software

x.25 private net

Domino's PC Client software

"I have a source in Cleveland. They're open late."

"Was your delivery of #2 boxes late this week?"

Source: Domino's Commissaries

Domino's PC Client software

x.25 private net

Domino's Macintosh Client software

▲ ALL TOGETHER NOW: Domino's commissaries link up to a company bulletin board managed by Connect, Inc. over a secure X.25 network

business operations for over 1800 major corporations around the world. In fact, 9 of the top 10 Fortune 500 companies count on SAP to put more people in the driver's seat with greater access to the information they need, enterprise-wide. So to find out just how our integrated client/server solutions can help you speed past your competition, call SAP ASAP at **1-800-USA-1SAP, ext. 500.**

G R E A T E N T E R P R I S E S.™

CLIENT/SERVER BULLETIN BOARDS ENABLE USERS TO BECOME MORE PROACTIVE WITH THEIR CUSTOMERS.

with their customers, observers suggest. Companies can gain or maintain their competitive edge by anticipating calls and sending information such as problem resolutions, upgrades and software patches over the client/server network.

And quasi-private bulletin boards aren't the only systems that alleviate a corporate failure to communicate. For companies that can't afford the deployment and administrative pains of Notes, a service is being tested to allow sites to access the groupware package — and robust bulletin board creation capability within — via AT&T Corp.'s public telephone network. It is expected to cost $500 to $1,000 per seat per year, according to both companies.

MOVING ON THE EDGE

Johnson & Higgins, a New York insurance broker, expects to begin beta-testing AT&T Network Notes early next year. "We haven't quite decided how to use the pilot project or what application we're going to test," said Bill Wilson, senior vice president of IS at the firm. "We're just going to move the applications with the greatest potential. But no matter which ones we transfer, we're going to be even more ahead of the curve."

Johnson & Higgins expects to gain even more of a competitive edge by having the phone company handle customer service operations, an area sure to require bulletin board applications, Wilson pointed out.

Other groups have already climbed that mountain.

"We went to Connect in 1988 because they were the only commercial company offering on-line capabilities in a graphical environment for Mac and Windows platforms," explained Sam Karp, executive director at HandsNet, a Cupertino, Calif.-based on-line service for organizations working for economic and social justice. Although Connect still offers the most for the least, "its true competitive advantage is an on-line tool that allows us and our forum providers and their information managers to independently manage their data," he said.

That activity occurs through tools that allow for the management of a hierarchical file folder structure that users can access remotely. Thus, HandsNet does not have to rely on Connect to create, rename or position the management folders. And with HandsNet in control of its network, Karp said, the company can provide more services more quickly than its competitors.

Those competitive fires will burn ever brighter as Karp confronts the challenge of continuing to differentiate his service from the newcomers expected to flood the market if the vaunted information highway ever comes to life. Karp said he also worries about how to provide the same ease of use if or when the information superhighway explodes HandsNet's user base from its current 3,000 subscribers to an anticipated 10,000 members.

Those members are linked via Connect's client front-end Business Information Service software using X.25 packet-switching networks. HandsNet consumes about 3,700 hours per month. Karp declined to reveal the price he pays for his connection, but it's reasonably safe to say he gets back more than he puts in.

KEEPING IN TOUCH

The same goes for Domino's. The pizza maker's installation of a client/server bulletin board should more equally distribute corporate information resources throughout the company and give distribution customers — the retail pizza outlets — key job performance data more quickly and accurately, Smith said.

Users, mostly Macintosh types with a sprinkling of PCs, average about one hour and 40 minutes on-line a month. That time costs Domino's about $36 per user, according to Kate Gladney, Connect's vice president of customer relations.

That's nothing compared with Domino's return on investment. Although neither Gladney nor Smith would precisely delineate the amount Domino's has saved, the bulletin board is eliminating costly faxes and phone calls to the home office.

"Things are going really smoothly now," Smith said. "We're getting less requests to the home office for information. The information flow now works bottom up as well as top down."

Gaining expertise with the network is now a factor in the employees' career path, Smith said. "And we plan soon to have access through the network to outside databases, such as weather forecasts that will help delivery drivers."

Think about that the next time you order a Domino's large pie with sausage and extra cheese. ◪

Schatz is a free-lance writer based in Washington.

Domino's Laura Smith says gaining network expertise is a career path factor

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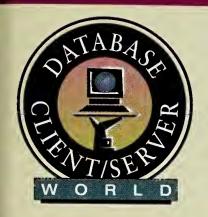
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More for Your Money

JONATHAN VAUGHAN

Vaughan is vice president of applications systems technology at The Chase Manhattan Bank NA's corporate technology and information services group. He has spearheaded the introduction of client/server technology at Chase and chairs a bankwide client/server working group. His CompuServe ID is 70403,2557.

A number of articles and analyst reports have recently focused on the true cost of client/server computing. Unremarkably, they have found it to be higher than originally forecast. This has raised the question of whether client/server — like so many previous technology fashions — is a spent silver bullet, overhyped in infancy and now revealed in adolescence as a costly, ineffective solution.

Unlike CASE or pen-based computing, client/server is not an unfulfilled vision nor a mistargeted technology but rather a fundamental shift in computer systems architectures driven by the GUI on the client PC. As a result, not only are vendors and their support structures being thrown into turmoil, but the corporate computing environment is also agitated by the storm surge of change.

For example, end users try to use GUI tools to build complex computer systems without knowledge of system design and support; consultants and systems integrators are barely a half-step ahead of customer needs; and vendors release production software that doesn't work in customer sites.

Not surprisingly, the revisionist studies of client/server identify support costs as the major hidden component that increases system costs. You can expect both the support costs associated with product and market immaturity and end-user labor to fall as support tools/services mature. To count end-user labor as a client/server cost in comparison with traditional computing architectures misses some key points:

● The GUI environment provides functions unobtainable in a character-based terminal system. The added costs associated with exploiting the environment are irrelevant to a comparative study.

● Client/server systems are in their adolescence and frequently change. When systems change, they typically increase the learning demands they place on users.

● The ancillary end-user labor costs associated with wide-scale deployment of client/server systems are more properly seen as work force computer education, not support costs.

If no account is taken of the impact the new technology has on the work processes and roles, then education is seen only as a cost rather than as an investment in people.

At Chase, we have found a number of approaches that help reduce costs and move end users more rapidly into client/server:

● Development of an integrated classroom training curriculum.

● A self-guided learning facility that makes training material available to individuals in their own time and at their own pace.

● Pilot and partnership technology transfer programs that allow expert knowledge to be leveraged across the organization.

● Development of a corporate support infrastructure, which provides a common interface for business areas to deal with production issues.

● Setting a standard for core infrastructure components to improve interoperability and reduce support costs.

● Limiting the number of hardware and software vendors to reduce costs by simplifying the environment and increasing the organization's level of expertise with the vendors' products.

None of these approaches work without a management commitment to foster an innovative culture and invest strategically in new technology. But with the right support, the focus shifts from the cost of client/server to the opportunities it creates. ◪

When systems change, they typically increase the learning demands they place on users.

Objects Meet

Where Databases Diverge

MAYo

Objects will increase their role in distributed systems, but not without a few growing pains

Objects will play an increasing role in building client/server systems, and in many cases, an object-oriented database will be one of the prerequisites for implementing these next-generation systems.

As packages of complex information, including image, voice and video as well as numbers and text, objects can be stored and retrieved by object databases in an efficient, straightforward fashion. The systems maintain unique identifiers for each object, giving them a ready-made handle for being implemented in a distributed fashion.

But for the most part, object database vendors are still small and minimally financed. They have not brought out "federated" or distributed versions of their products that make it easier for multiple databases to work together.

At the same time, a new piece of middleware has emerged: the Object Request Broker (ORB), which receives requests for object services and dispatches them to their proper destination. It is early for production systems to have databases and ORBs work-

BY CHARLES BABCOCK

ing in tandem; the standard for the distributed version of the Common Object Request Broker Architecture (CORBA) is still being hammered out. But object experts predict they will be working together soon.

Object systems are already being built to tackle business tasks that more conventional systems cannot handle. In many cases, they remain rudimentary pilot projects, based on a Unix server and a handful of workstation or PC clients.

In a few, the groundwork is being laid for larger, networked object systems that will one day serve hundreds of concurrent users.

DRILLING FOR OBJECTS
TerraSciences, Inc. in Denver has built an application for analyzing geological reservoirs for oil companies. The application needs to use objects because it uses complex drilling log data from each well site.

Users access it from PCs connected to a Hewlett-Packard Co. workstation under X Window System terminal emulation. But as Gary Branson, vice president of marketing, pointed out, "The day will come when we have to do this in a more distributed fashion," tapping into millions of dollars' worth of geologic data stored in scattered databases.

To prepare for that day, TerraSciences first moved to an object-oriented approach in application building, due to the varied data types it was working with, and opted for HP's OpenODB, an object database engine sitting atop AllBase, HP's relational database management system.

The combination lets the company import data from relational tables (the oil industry makes heavy use of Oracle Corp.'s Oracle and other relational systems) and store it as objects, if necessary, in OpenODB.

OpenODB is a hybrid, relational-plus object system. Another way to handle both objects and relational

Relational

Performs ad hoc queries against simple data in tables using SQL.

Good for transaction processing.

Is independent of any programming language.

Object-oriented

Invented as part of an object-oriented programming environment, OODBMSs tend to be tied to a single object-oriented language. (Gemstone and Versant work with two, C++ and Smalltalk.)

No SQL equivalent and no ad hoc queries.

Good performance in handling complex, user-defined data (objects).

data is with a system that uses relational's SQL data access language, which can also manipulate objects through extensions of standard SQL. These are known as object relational systems.

PLAYING THE MARKET
National Investment Management in Milwaukee has built a stock analysis system that uses such a system from Illustra Information Technologies, Inc. in Oakland, Calif. Illustra can store objects and access them with the SQL data access language, giving it the ability to field researchers' ad hoc queries against historical data on 3,000 stocks.

The database engine runs on a Sun Microsystems, Inc. SPARC 10 server connected over a Novell, Inc. NetWare 4.01 network to four Intel Corp. I486-based PCs, using X terminal emulation.

Jim Maldonado, research manager at National Investment, said his firm needed an object-oriented system to treat the repetitive information on stock trades as a data type that can be encapsulated in an object rather than using thousands of repetitive rows in a relational system. PC-based traders can then issue queries against the database, searching for patterns where earnings reports and market conditions coincide with rises and falls in the stock.

The searches are executed so much more efficiently with the object-based system than with a relational system that Maldonado hopes someday to feed live stock market data into the database, allowing National Investment traders to improvise queries based on the day's trading.

"There's a lot of things we have to do right" before that can happen, Maldonado said, but doing ad hoc queries against incoming data could yield a competitive advantage over other investment firms.

Another investment company, Renaissance Technologies, Inc. in Stony Brook, N.Y., is using another

object relational system from UniSQL, Inc. in Austin, Texas, to add current trading data to its seven years of trading data on selected stocks. Analysts on Sun SPARCstation 10s connected over a Sun Network File System network to a SPARCstation 4 server can search the data, looking for patterns of highs and lows that match present-day market conditions.

Joe Trubisz, senior analyst at Renaissance, said a large trading firm would seek an 18% or 19% return on the firm's $400 million portfolio. With the new object-oriented system, the firm's "results have been phenomenal," he said, claiming Renaissance is on a pace to obtain an annual return of 54%.
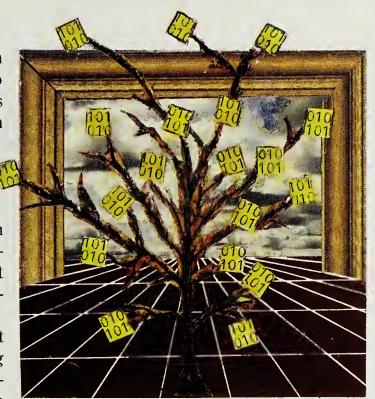
Trubisz said such a system requires a staff of "highly paid mathematicians" to formulate the queries that search the trading data. The system was written and is maintained by Trubisz, not a large team. Actual computer resources remain small because only a handful of analysts are launching queries against the database.

Although Renaissance is a pioneer in using an object relational system, "every trading firm has an analytical trading group looking for that extra bit of mathematical help," he noted.

BIGGER THINGS IN MIND
These and other firms clearly have bigger things in mind than these pilot systems. Conor Shankey, director of product development at Prodigy Technologies Corp. in Vancouver, British Columbia, has built a 10-programmer network around Servio Corp.'s Gemstone object-oriented DBMS.

Although the development team is small, the facilities management application is being built for a large Canadian utility and was designed to work over a TCP/IP network with 800 Macintosh and Windows PC users. The database system will run

Hybrid Object-Oriented/Relational

A combination OODBMS engine on top of a relational DBMS (HP's OpenODB).

....

Constructs objects from data stored in relational tables and has some advantages from both.

....

Performance suffers.

Object/Relational

Different from hybrid because it uses SQL with proprietary extensions (UniSQL, Illustra) and handles objects directly, rather than through reconstruction.

....

Is able to both store objects and perform ad hoc queries.

....

Early reports indicate it can match or outperform relational in queries against complex data.

....

on an HP T500 multiprocessor server.

The facilities management system works with complex data that reflects the status of the utility plant and equipment. Prodigy spent three years developing it at a cost of "several million dollars," Shankey said.

These early, object-oriented commercial applications will face a host of complex issues as they grow toward becoming distributed client/server systems. As in the case of TerraSciences, companies will all want to gain access to legacy data or corporate data in relational systems. Prodigy actually started its facilities management project with a Sybase, Inc. relational system before it switched to Gemstone.

Users can store objects in relational tables by breaking them down into separate data types and flattening the data into rows and columns, but system resources are strained when relational joins are executed across multiple tables representing complex relationships.

Prodigy's model for facilities management reflected 50 to 60 interacting relationships, and when the application required five or six joins, "the relational systems started to bog down quite rapidly," Shankey said.

Nevertheless, straight relational database systems often harbor the corporate data and reflect years of intense, production-oriented development. They have been given journaling, backup and recovery features that guard against crashes and the two-phase commit that allows distributed databases to stay in sync through updates.

CHIP GEM
Texas Instruments, Inc. in Plano, Texas, uses Gemstone in a production system to capture data in a chip manufacturing environment. Senior technical staff member Chuck Chase said it was only with Version 4.0 (delivered in August) that TI felt it could

A NEW GENERATION

The need to handle relational data in a more object-oriented fashion prompted the Petrotechnical Open Software Corp. (POSC), a consortium of 16 oil companies in Austin, Texas, to draw up a specification for the exchange of information between relational and object-oriented systems.

The POSC has selected UniSQL and OpenODB from Hewlett-Packard as the first systems to meet its specifications.

Much of the oil industry's geologic and seismic data is stored in relational databases they would like to sell to one another and analyze in modern systems.

"Our users want a clear relational system with tables and attributes that they know how to access through [SQL]. They don't have it yet," said Bruno Karcher, the POSC's director of operations.

UniSQL recently signed an agreement with Oracle to serve as an object-oriented front end to Oracle POSC members. It is estimated that as much as 70% of the oil industry's data is stored in Oracle databases.

In addition to POSC, more general standards are emerging, aiding the distribution of objects.

Most object-oriented vendors support the effort by the Object Database Management Group to establish an equivalent of SQL for the object-oriented users. Dubbed ODMG-93, the proposed SQL-like language is expected to be adopted by Oct. 1, 1995, said Doug Barry, executive director of the Minneapolis-based group.

As the Object Management Group in Framingham, Mass., continues work on CORBA II, the object request broker will become a distributed routing mechanism, handling messages between objects that will one day be written in different languages and reside in databases on different platforms.

These and other developments will eventually usher in a new era of client/server computing.

Although many of the machine and network configurations will look the same, the workings of object databases and other object mechanisms beneath the surface will herald a new generation of business applications, and competitive companies will scramble to take advantage of them.

---

rely on its backup and recovery capabilities, which needed to be available three shifts a day, seven days a week.

The manufacturing system replaces an IBM mainframe system that TI had used for 10 years. As TI designed new chips, it had difficulty getting the IMS-based system "changed before the product was outmoded," Chase said.

Because Gemstone works with the Smalltalk language, the system follows the object-oriented principle of inheritance. Developers can change the system quickly by compiling a new object with many of its features inherited from predecessor objects.

In addition, the object-oriented manufacturing system can handle a variety of complex data types, including images of etching masks, data on equipment maintenance status, chip specifications and wafer dimensions. The system brings the information to bear at each stage of the chip fabrication process, capturing relevant data about the process.

At the end of the production line,

Renaissance Technologies' Joe Trubisz utilizes a staff of 'highly paid mathematicians' to formulate trade queries

the system helps the manufacturing staff spot anomalies in the process and is a key element of quality control, Chase said.

Several object-oriented database users pointed out that their systems have not been augmented to work in a distributed fashion. "In the current version of Gemstone, they don't support federated databases," Prodigy's Shankey said.

Another hindrance to distributed object systems is internal indifference or resistance. George Larsen, information technology consultant at Cadence Design Systems, Inc. in San Jose, Calif., said his firm uses Sybase's Gain to develop object-oriented instruction systems.

The Gain environment makes it simple for users to create a menu item that connects the application to data in a Sybase or other relational database. "We use it here on the technical side, but our business side" uses relational systems, Larsen said.

"Our biggest problem was we had to interface to so many different IS groups," Shankey recalled. His Prodigy group created a dozen real-time CICS interfaces between Gemstone and mainframe applications written to DB2 and IMS, with little assistance from the information systems units.

"It was very difficult politically. We were trying to attack an army with a battalion," he said. ◪

Babcock is Computerworld's *technical editor.*

Database Dilemma

As companies re-engineer, the question arises whether to use an object or relational database as part of the foundation. Like a good consultant, I say, "It depends."

A relational database is a data store in which applications read and write data. An object database is, in effect, a shared virtual memory extension to your applications. Both can be used for client/server applications. Objects can be decomposed into and composed from relational tables either by SQL encapsulation classes or by embedded SQL in fundamental problem domain classes.

Problem domain servers can be built on object databases to serve non-object-oriented client applications. The architectural differences create engineering trade-offs.

Contrary to popular perception, object databases should exhibit superior performance to relational databases. Once an initial object is found — say, CUSTOMER=Jones — then all related objects such as outstanding purchase orders are immediately available.

To perform the same function, a relational database must perform multiple I/Os, use multiple indices and assemble all the data into some form of record.

Object databases support abstract information better. A typical object database may have a class such as COMPANY from which the subclasses VENDOR and CUSTOMER are derived. An application can then ask for COMPANY and get all VENDORs and CUSTOMERs that meet the query criteria. The same thing can be accomplished with a fully normalized relational database, but it requires more planning to create common tables, foreign keys, appropriate views and queries. Object programmers simply ask for

> **Contrary to popular perception, object databases should exhibit superior performance to relational databases.**

the object of their desire.

Object databases also facilitate change better. Assume initially that CUSTOMER has an attribute of CREDIT LIMIT that is a fixed value. Later, the business rule is changed, and CREDIT LIMIT becomes a dynamic calculation based on past business volume and payment history. Because good object-oriented applications never access attributes directly, only through methods, an update to the object dictionary and a change to the class CUSTOMER accomplishes the new business rule.

But object databases are relatively immature, the capabilities ascribed to them vary among implementations, and standards are still forthcoming.

Most object databases support only C++ and Smalltalk, while relational databases strongly support 4GLs, report writers and other personal productivity tools. Handling concurrency (multiple programs accessing the same object instance) requires more programming with objects.

Relational systems also provide better distribution capabilities and tools for performance tuning, backup and recovery. Discipline and programming are required to achieve the same level with object databases.

Finally, many object database capabilities will eventually be accomplished with a relational technology, though with more effort and performance costs.

Therefore, before you undertake development, develop an enterprise information and technical architecture. Then you can choose among all the technologies, mix and match and evolve among them without impacting problem domain applications.

Like the man said, "It depends." ◪

JIM STIKELEATHER

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Charged Up
to Compete

As deregulation looms in the near future, utilities expect client/server's surge to benefit business

THE UTILITIES INDUSTRY ISN'T WAITING for 50 state legislatures and Public Utility Commissions to see the legal light of day. Instead, many power providers are charging up their business strategies with open, client/server technology to prepare for the inevitable fallout of deregulation.

This is shocking for an industry that basked in government guarantees for nearly 100 years, assuming a stable customer base and the leisure of slow adjustment to changes. The yawning pace produced risk-resistant information systems departments focused primarily on mainframe processing.

But when Congress passed the Energy Policy Act of 1992, allowing the states to deregulate and clearing the way for the sale of power across state lines in 1995, those guarantees were up.

"Forty percent of the utilities will be gone in 10 years, and the rest we won't recognize because of restructuring," said Arthur Stern, CSC Index, Inc. vice president of the utilities practice.

As soon as the Energy Act passed, power providers began to restructure financial, human resources, customer service and supply management operations into client/server systems that exchange data with monolithic mainframes.
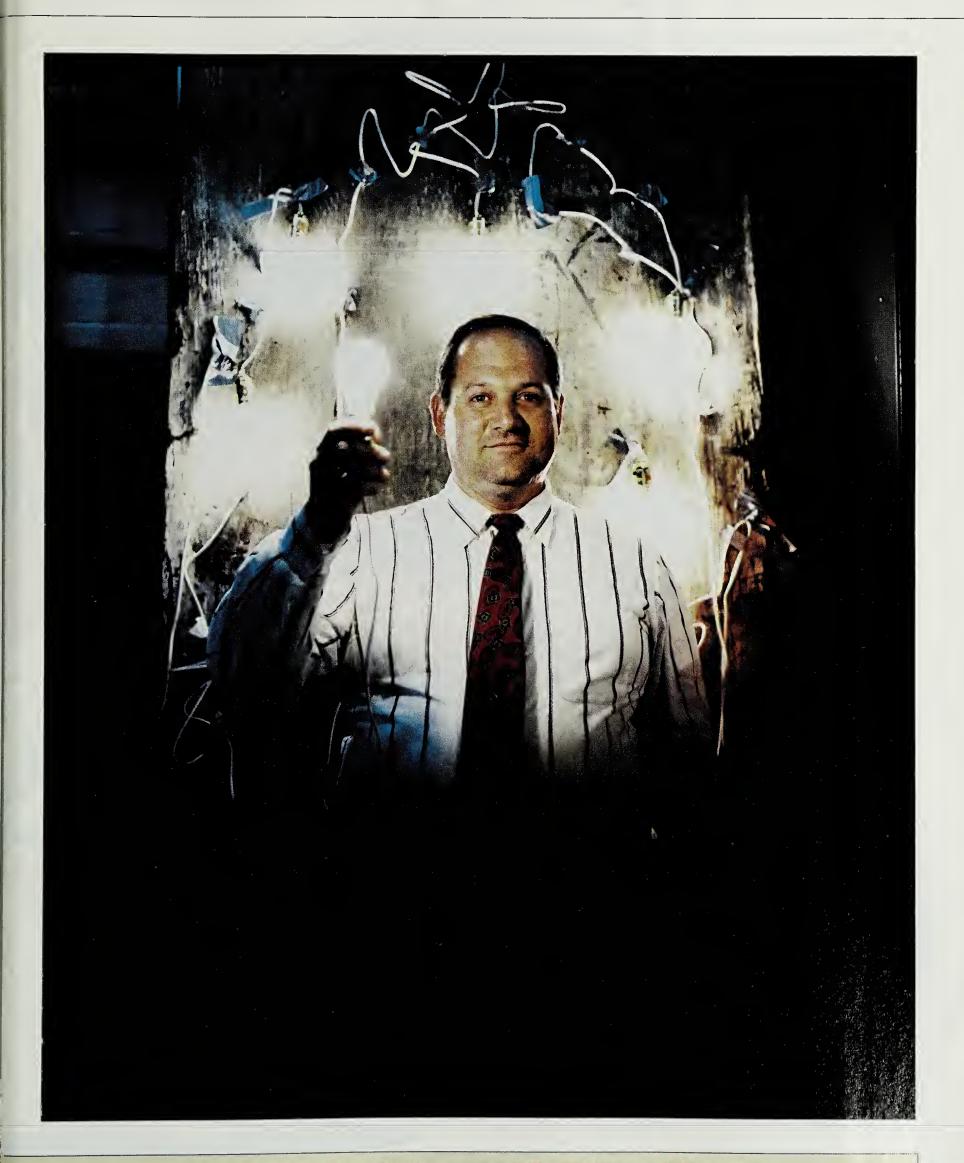
These new client/server systems are expected to let users analyze data and decide quickly how to adjust costs and services in response to changing market conditions. This will allow utilities to adapt to whatever deregulation brings.

Some utilities have already turned these expectations of client/server into reality. Gary Fechter, Trigen Energy Corp.'s director of analytical services, said, "We provide [in] real time the dollars per hour it costs us to run each plant. We know which pumps to switch on or off to bring the costs down." Trigen is one of the few utilities that operates entirely in a client/server environment (see story page 76).

The rate and extent of change at large utilities enduring deregulation may be unmatched by other industries unless the Federal Communications Commission lets the regional Bell operating companies offer
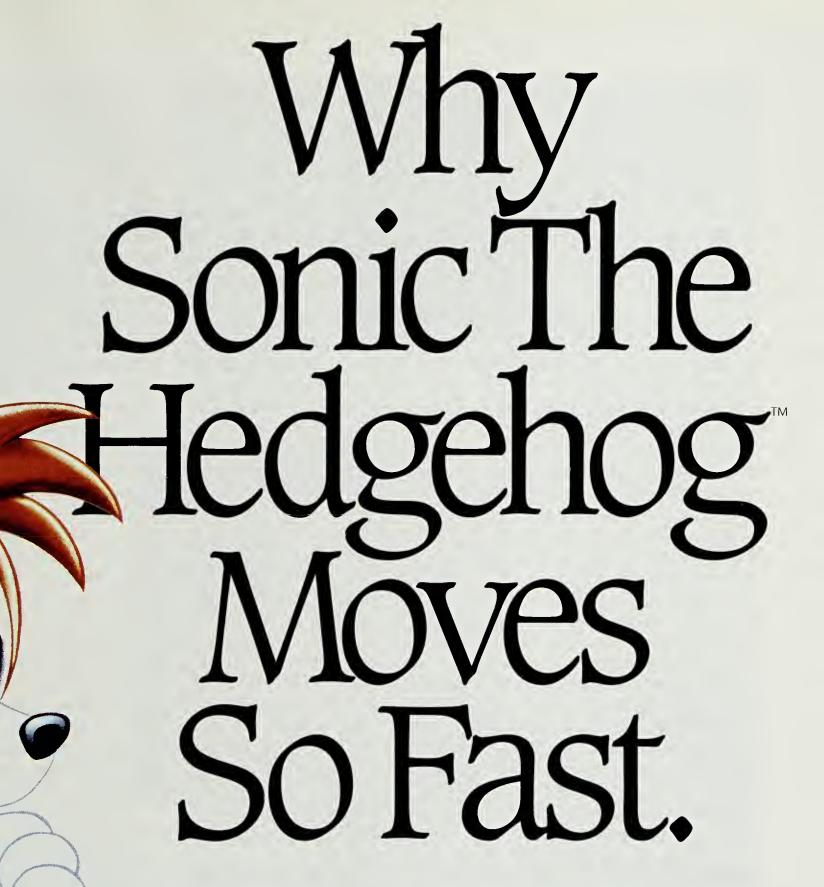
BY CHERYL GERBER

Trigen's Gary Fechter proves client/server can work: The utility has never had a mainframe

long-distance services. Entergy Corp. in New Orleans, the third-largest utility in the U.S., is one such example.

In one year (1992-93), Entergy bought hundreds of Hewlett-Packard Co. and Sun Microsystems,

With client/server, Dennis Walsh says Entergy's savings exceeds his budget

Inc. workstations running HP/UX and Solaris and began building new financial, work management and Area Management/Facilities Mapping systems. The company grew its wide-area network connections 450%, expanding from 50 unconnected LANs to 550 LANs attached to the WAN, and shifted to standards-based networking.

"In May 1992, we had no Unix MIPS. We now have all new application development in Unix client/server environments using Oracle and Sybase," said Dennis Walsh, Entergy's chief information officer.

While Walsh declined to provide specific cost savings garnered by client/server, he did say his savings exceeds his budget. "Every system we develop now has to have a positive savings or we don't do it. Nothing

gets a free ride, including the cost of application and database development."

Another speedy deployer of client/server is California's Pacific Gas & Electric Co. (PG&E), which implemented its first enterprisewide client/server application in June. Using the Computer Telephony Integration configuration that has become common in call centers, PG&E consolidated 31 phone centers to four to provide customized 24-hour service.

PG&E installed IBM RS/6000 servers and a CallPath 6000 voice and data system and linked them with Cisco Systems, Inc. routers and AT&T Corp. switches to 1,100 end users, each with a 486 Windows PC running Information Management Associates, Inc.'s telebusiness software, called Edge. That system is also connected via TCP/IP to a customer information system on the mainframe that PG&E is linking to an Oracle Corp. customer service history system. It will be operational the first quarter of next year, said Mike Wilhoit, PG&E's project manager.

"Customer service will cost one-third less than it used to by doing diagnostics over the phone rather than sending out a field repair person," Wilhoit said.

The most difficult obstacle for utilities to overcome is the mainframe mind-set, Entergy's Walsh said. Another hurdle is the network balancing act required between PC user and corporate applications. "We want as small a transaction as possible moving through the network to avoid contention problems," he said.

Entergy's first attempt at building a new client/server budget system was a disaster. Still new to client/server in late 1992, IS had mainframe expectations and thought it could apply an understanding of PC applications to client/server architecture. "We would download everything to [Microsoft Corp.'s] Excel to manipulate the data, then upload the data and re-enter it into the Sybase database, doing it like batch operations," said Randy Pledger, Entergy's director of database administration.

The client/server team rebuilt the system from scratch last year. This time it was a success. "Now we still use Excel as the front end, but we compile Excel with the Sybase libraries included," Pledger explained.

It is clear from Entergy's experience that even utilities that start early

PLUGGED IN TO UNIX

Trigen may provide a peek at the future of utilities operations and a more environmentally conscious method of operation.

The White Plains, N.Y.-based power company has never had a mainframe. Since its humble beginning in 1987, Trigen has run entirely on Unix servers connected via TCP/IP, while growing to a projected $220 million in revenue this year. In seven years, Trigen acquired 10 new power plants in parts of New Jersey, Oklahoma, Missouri, New York and Chicago.

"Client/server allowed us to buy a new server every time we acquired a new plant without any preinvestment in a large system," said Gary Fechter, Trigen's director of analytical services.

"We faced a big hurdle integrating the new plants' IS and process control systems into ours. But because we restricted ourselves to standard [blends of] Unix and didn't play with a lot of

techie toys, we were able to integrate disparate systems relatively easily," he added.

Trigen also operates an environmentally conscious trigeneration plant. Cogenerators are only 70% fuel-efficient, whereas a trigeneration plant is 85% fuel-efficient, Fechter said.

For a power plant, Trigen uses unusual systems for its energy process control. Designed by Motorola, Inc. and Honeywell, Inc., the systems contain a coresident, real-time operating system called cXos alongside AT&T's Unix System V.

Those systems are linked to the company's PCs using Beame and Whiteside's TCP/IP or The Santa Cruz Operation's Open Desktop Version 2.0 on Intel Corp. I486 PCs. The PCs do all accounting and billing and function as network file servers.

"The greatest obstacle to integrating the disparate systems into our client/server environment was psychological. We feared the technology," Fechter said.

don't realize how tough it can be to implement client/server. "Our clients don't realize the amount of training that has to take place when you deploy client/server technology to reflect business practices," said Mike Swartz, vice president of Electronic Data Systems Corp.'s utilities division. "The person who is using the technology today has to be more attuned to the company's business," he said.

Both Entergy and PG&E — as well as Southern Power Services Co. (see story at right) — have simplified potentially complex networking problems by paring down protocols and standardizing on TCP/IP.

Florida Power Corp. is one of a growing number of utilities that have turned to systems integrators for help making a faster transition to client/server. The company moved 70% of its processing off the mainframe onto Microsoft Windows NT clients and HP servers. The HP servers act as Unix gateways into IBM mainframes, where DB2 resides.

Florida Power developed its client side using OS/2 but wanted to implement it using Windows NT, so it called on Andersen Consulting. Andersen used its Unix-based computer-aided software engineering tool, Foundation for Cooperative Processing (FCP), to move off OS/2 onto NT.

"We were able to do it in one month because we have a layer of architecture in FCP that isolates the application code and calls from the operating system," said George Hill, worldwide managing partner of Andersen's utilities business practice.

However, Florida Power is holding off on distributing data. "Until the connection between DB2 and Oracle is made secure, we won't distribute data — only processing," said Mitch Hull, manager of information services at Florida Power.

Although it is still unclear exactly what industry structure will evolve

WHEN LESS IS MORE

Southern Power Services counted 530 different internal payroll systems replicating data across Georgia, Alabama, Mississippi and Florida. "It was just a mess," said Debra Louis, IS project manager.

The company is converting payroll processing for its utilities in those states from a mainframe to PeopleSoft, Inc.'s client/server-based Human Resource, Benefits Administration and Payroll software. Gupta Corp.'s SQL Windows is used as a front-end query tool to an Oracle database on HP 9000 machines running HP/UX.

Although its long-term strategy is to rely more on TCP/IP, the power company depends on Gupta SQL gateways to convert SQL transmissions into packets for IBM LU6.2 (a standard communications protocol for the 3270 environment) transmission to the DB2 environment.

But IS can't get its hands on the monitoring tools that would give the network control center status on its Gupta gateways. "It's a sorely absent product and a source of frustration for us here. We are trying to implement best practices, and this hinders our ability to support the client," said Ed Woodyear, Southern Power senior analyst.

Woodyear and Louis don't find out a gateway is down until they have 50 people calling the help desk. "Monitoring tools would immediately alert an operator at the help desk that we had a systems failure, and resources could immediately be deployed," Woodyear said.

Another problem the power company is experiencing is router version or application programming interface compatibility.

Southern Power's Debra Louis is converting a 'mess' of payroll systems to PeopleSoft

"PeopleSoft is not certified to the same version of Gupta routers that our SQL Windows is, so they can't be run simultaneously on workstations," Woodyear said. This means the team can't multitask — one of client/server technology's promises.

Southern Power is working with PeopleSoft and Gupta to overcome these hurdles by February 1995, the date for going live with its client/server payroll and benefits systems.

from deregulation, some things are known: The three integrated segments of the utilities today — power generation, transmission and distribution — will become unbundled upon deregulation. The first will become a low-priced commodity, the second will be the sole regulated portion, and the third will be a service business to which utilities add value. Utilities must decide whether they will be in the power generation or the

distribution business in 10 years.

To prepare the utilities for the business change in the second industrial revolution, EDS' Swartz said, "We advise our utilities customers of the old competition axiom: 1% better information one day sooner and the means to use it." ∎

How client/ server
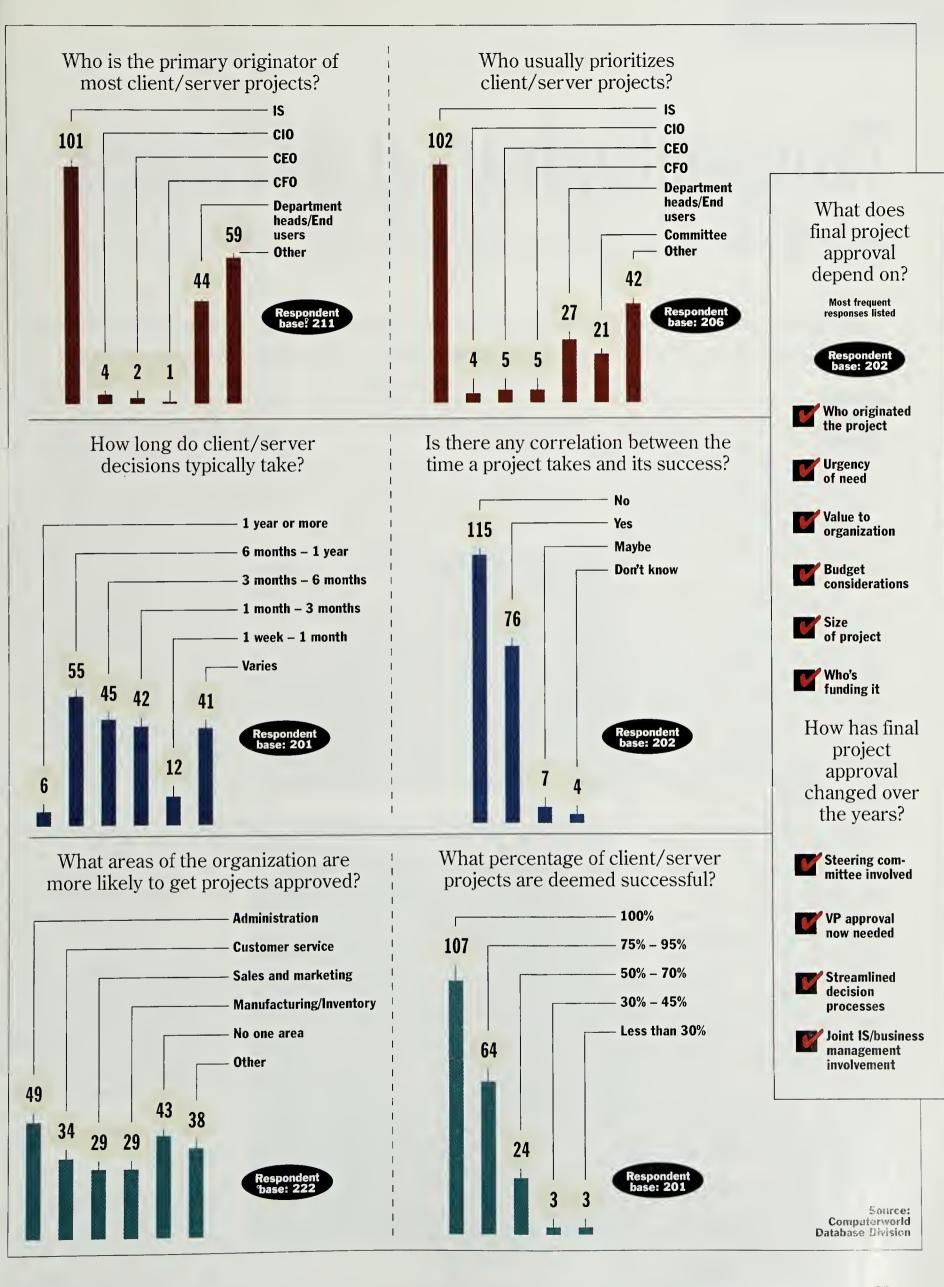
DECISIONS are made

Though distributing computing often correlates with decentralized management, IS organizations are still heavily influencing how client/server is implemented

Who is the primary originator of most client/server projects?

- IS — 101
- CIO — 4
- CEO — 2
- CFO — 1
- Department heads/End users — 44
- Other — 59

Respondent base: 211

Who usually prioritizes client/server projects?

- IS — 102
- CIO — 4
- CEO — 5
- CFO — 5
- Department heads/End users — 27
- Committee — 21
- Other — 42

Respondent base: 206

What does final project approval depend on?

Most frequent responses listed

Respondent base: 202

- ✔ Who originated the project
- ✔ Urgency of need
- ✔ Value to organization
- ✔ Budget considerations
- ✔ Size of project
- ✔ Who's funding it

How has final project approval changed over the years?

- ✔ Steering committee involved
- ✔ VP approval now needed
- ✔ Streamlined decision processes
- ✔ Joint IS/business management involvement

How long do client/server decisions typically take?

- 1 year or more — 6
- 6 months – 1 year — 55
- 3 months – 6 months — 45
- 1 month – 3 months — 42
- 1 week – 1 month — 12
- Varies — 41

Respondent base: 201

Is there any correlation between the time a project takes and its success?

- No — 115
- Yes — 76
- Maybe — 7
- Don't know — 4

Respondent base: 202

What areas of the organization are more likely to get projects approved?

- Administration — 49
- Customer service — 34
- Sales and marketing — 29
- Manufacturing/Inventory — 29
- No one area — 43
- Other — 38

Respondent base: 222

What percentage of client/server projects are deemed successful?

- 100% — 107
- 75% – 95% — 64
- 50% – 70% — 24
- 30% – 45% — 3
- Less than 30% — 3

Respondent base: 201

Source: Computerworld Database Division

Throwing Hardware at the Problem

Solid-state disks can help improve database performance

BY ALAN ALPER

BEA ASSOCIATES, A NEW YORK investment management firm, had an existence-threatening problem: The relational database it used for portfolio management and accounting was constantly crashing under the stress of heavy use and contention for systems resources.

The investment house, which manages about $22 billion in assets, had tried everything its vendor, Sybase, Inc., had suggested but to no avail. Processes still backed up into one another, while the database log grew to 1.2G bytes.

BEA eventually found what some would consider an old-fashioned remedy: A solid-state disk (SSD) subsystem with a 20M byte/sec. transfer rate to boost performance of Sybase's SQL Server 4.9 residing on a Pyramid Technology Corp. 10-processor system accessed by homegrown client applications over a Novell, Inc. NetWare 3.1 network.

SSD — devices that contain semiconductor memory, an I/O server, SCSI connections, battery and disk backup — are occasionally deployed on mainframes and minicomputers to speed access to often needed files and database tables.

An SSD built by Santa, Clara, Calif.-based Disk Emulation Systems, Inc. was de-ployed by BEA to off-load tables contained within Sybase's tempdb — a scratchpad workplace where the database does temporary sorting and manipulation of data.

Prior to the SSD's installation last August, BEA's system would crash 15 out of every 20 business days, recalled Steve Buckridge, the firm's vice president of information systems. "We've gone down zero times since then."

Some shops that are pushing the client/server envelope in on-line transaction processing and decision support are finding that SSDs enable them to achieve mainframe-like performance. SSDs help by circumventing the I/O bottleneck inherent in rotating disk drives scattered throughout distributed computing networks.

That's what A. C. Nielson Market Research, North America in Bannockburn, Ill., found when it put elements of a 60G-byte Sybase decision support database containing information on 1,000 products on a Disk Emulation Systems SSD. I/Os per second increased from 250 to between 800 and 1,000, and the creation of an index for a 40-million record table now takes one hour compared with eight hours, noted Mark De-Meo, project consultant.

The downside to SSDs is the expense: Subsystems can be priced anywhere from $135 to $150 per megabyte, compared with only 30 to 50 cents per megabyte in rigid disks with 2G-byte or higher capacity, according to Dennis Waid, president of Peripheral Research Corp. in Santa Barbara, Calif.

For BEA, however, not solving the problem would have been more costly, Buckridge pointed out. For example, in one market in which the firm trades, settlements must occur within a day; otherwise, the offending firm is slapped with a penalty worth 100% of the value of the transaction.

Therefore, "if the system is down and we don't get the settlement done, we have a *big* problem. Given the situation we were in, there was no downside," Buckridge explained. ◪

Alper is the editor of Computerworld Client/Server Journal.

Cutting Through the Chaos

Distributed computing creates redundant directories. Undeterred, some organizations are centralizing services via X.500.

A YEAR AND A HALF AFTER MARTIN MARIETTA Corp. merged with General Electric Aerospace to form the world's largest aerospace electronics manufacturer, Sally Egan, vice president of human resources in the information group, has a simple request.

"I want an electronic employee file where I can get everything I want to know about an employee: salary, benefits, compensation, stock options, address, phone number, emergency contacts and photographs," Egan said.

Now, administrators in Egan's division spend two to three days scouting 10 different legacy systems to gather the information they need on any of the 11,000 employees they serve, she said.

So Martin Marietta is planning to build by next year a standards-based, object-oriented directory that puts in one place all the employee information stored in proprietary "stovepipe" applications.

But the directory service won't stop there, according to Joe Cleveland, vice president and general manager of internal IS. Eventually, it will include passwords, Internet identifications and all the employee information that end users and applications throughout the company must access. It will be part of a distributed yet centrally administered directory service based on the X.500 directory standard.

"Human resources is one process in the corporation for which we need to build an 'electronic folder' of information," Cleveland said. "Once you build such databases, they can be accessed from a communications network, and you have the person identified for a broad array of purposes, whether you want to send the person mail or access information about them."
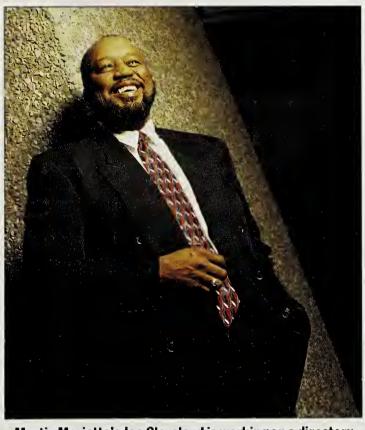
The directory service is especially timely for Martin Marietta, which is planning to merge with Lockheed Corp. Moreover, it is part of an overall strategy to overhaul business and information systems and move to client/server, Cleveland said.

Martin Marietta is typical of many large organizations in the throes of building a companywide directory to provide end users and applications with transparent access to distributed corporate resources, according to industry experts.

Most companies are starting now by integrating the pieces of a specific application directory, such as electronic mail. And during the next three to
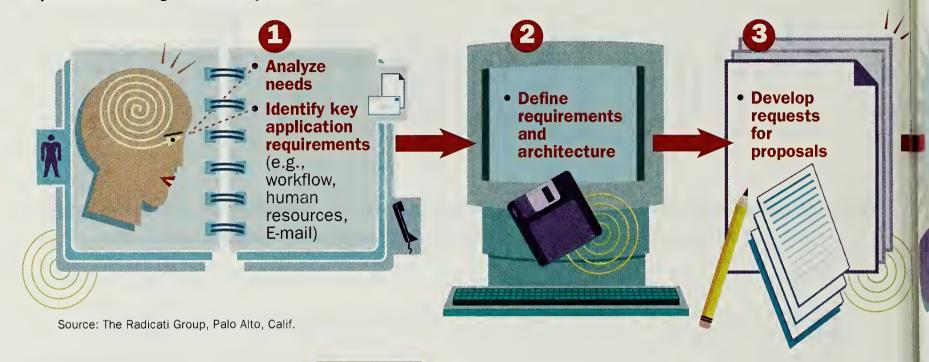
Martin Marietta's Joe Cleveland is working on a directory service that will put in one place all employee information

BY LYNDA RADOSEVICH

DEPLOYING CORPORATE DIRECTORY SERVICES

Large organizations with discrete directories for E-mail, human resources and the telephone network, among others, are beginning to see the benefits of integrating them into a cohesive network of services. Steps to create an integrated directory are as follows:

1
- **Analyze needs**
- **Identify key application requirements** (e.g., workflow, human resources, E-mail)

2
- **Define requirements and architecture**

3
- **Develop requests for proposals**

Source: The Radicati Group, Palo Alto, Calif.

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five years, they plan to weave the application directories into a cohesive directory service. The benefits are higher performance for less work: Users can find information without getting lost, and systems administrators don't have to maintain redundant information in multiple systems.

"An enterprise directory is the enabling technology that will allow fully distributed systems to be rolled out," said Richard D. Buchanan, an analyst at Forrester Research, Inc. in Cambridge, Mass.

However, today's bleak reality is that creating such a directory is mind-boggling, users say. Most existing E-mail, human resources, phone and network directories are custom-built, run on different platforms, contain only the information needed by the specific application and use different naming conventions. Pulling them together requires a major systems integration effort.

So an increasing number of companies are incrementally migrating their systems to the X.500 standard, a set of definitions for creating distributed directories. Once systems comply with X.500, they should be able to exchange information with one another and serve information to many kinds of client software.

However, X.500 comes with its

DIRECTING X.500

Progress on the X.500 standard hasn't been as fast as industry pundits once hoped it would be.

However, large user companies are increasingly calling for X.500 directories in their requests for proposals for electronic messaging systems, according to Sara Radicati, president of The Radicati Group, Inc. in Palo Alto, Calif.

"Basically, they want to have a centralized corporate directory that will hold a lot more than just E-mail information but will be a building block for all kinds of distributed applications that require naming and addressing," she said.

And vendors are beginning to recognize that. From LAN electronic-mail vendors such as Lotus Development Corp. and Microsoft Corp. to network operating systems vendors such as Novell, Inc. and Banyan Systems, Inc. to telecommunications companies such as AT&T Corp., providers say they are planning to provide X.500-based directories in their new wave of products.
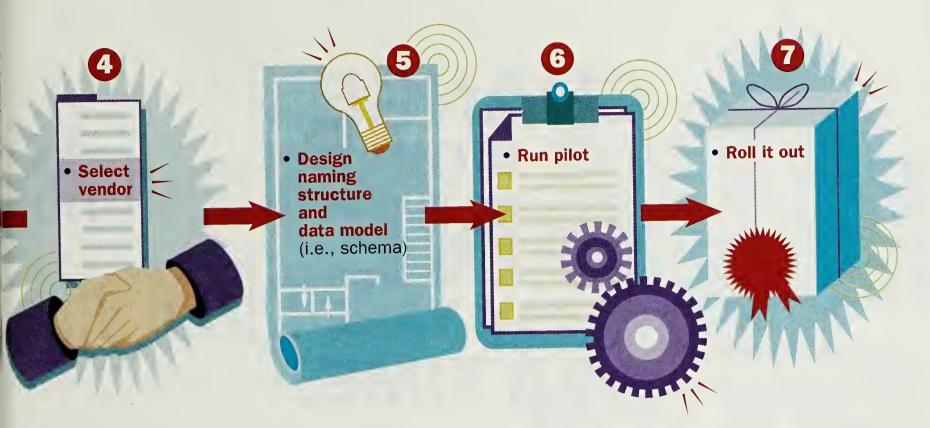
That should make it easier for those directories to exchange information via products from companies that are already shipping enterprise-level X.500 directory service software. Those companies include Digital Equipment Corp., Infonet Software Solutions, Hewlett-Packard Co., Control Data Corp. and others.

Meanwhile, standards groups are working to provide missing X.500 links. For instance, the X.400 Applications Program Interface Association is working on a directory standard to define how noncompliant directories can synchronize data with X.500 directories. The work is being done jointly with the Open Systems Environment Implementors Workshop at the National Institute of Standards and Technology, the government organization for standards technology.

Alternatives to X.500 exist but are not robust enough for corporate needs, according to users and analysts interviewed.

For instance, WHOIS++, a distributed Internet directory, is faster and less complicated than X.500, but it does not support the necessary hierarchical naming structure, according to Dan Blum, a principal at consulting firm Rapport Communication in Takoma Park, Md.

However, WHOIS++ and X.500 may coexist in the Internet environment, which would enable companies to link their X.500 directories with the Internet's World-Wide Web, Blum said.

4 • Select vendor

5 • Design naming structure and data model (i.e., schema)

6 • Run pilot

7 • Roll it out

own set of problems:
- It is a relatively young standard.
- Few products fully comply.
- It is complex.
- It doesn't define how to integrate proprietary directories.

"We're looking to move to X.500 as the standard matures and products are compatible," said John Stiles, groupware product manager at US West Technologies, Inc. in Denver. "But there are quite a few issues that may make us a later implementor."

US West built its own corporate directory that ties 14 E-mail system directories together via an Oracle Corp. database. In turn, the directory synchronizes with a personnel directory in a mainframe (IBM DB2) database. The directory contains information that X.500 doesn't provide. For instance, it tracks the type of E-mail and word processing systems users have so that when one user sends another a document, the directory automatically converts it into the right format, Stiles said.

"The question for bleeding-edge Fortune 500 companies is should they bet on the strategic value of X.500 as a directory," said Dan Blum, a principal at consulting firm Rapport Communication and author of *The E-Mail Frontier*. "While it may be somewhat expensive and difficult to use, it will pay off later because of its ability to integrate other systems, its rich object store, distributed nature and accessibility by third-party E-mail clients."

Carlton McKoy, manager of network architecture at The Southern Co., doesn't agree that the X.500 standard is lacking.

"When you talk to the LAN providers, they will say that there are pieces missing from the X.500 standard," McKoy said. "From what I've seen with how we're structuring our architecture for applications, there isn't a problem."

He should know. The $8 billion Atlanta utility is working on a large-scale X.500 pilot in conjunction with the Corporation for Open Systems (COS). The project, which initially targets E-mail, demonstrates how companies can synchronize their internal directories and exchange information with trading partners or customers using X.500. It is part of a Utilities Communications Architecture that was crafted by the Electric Power Research Institute and the National Institute of Standards and Technology to define an open computing environment for utilities.

Between January and April this year, Southern integrated roughly 12,000 host and LAN E-mail addresses through a Digital Equipment Corp. X.500 directory synchronizer. The host and LAN E-mail systems are integrated through an X.400-based message backbone. Southern exchanged X.500 directory information via a wide-area X.25 networking service with COS' X.500 service. This enabled users on both sides to locally access directory information remotely for the other organization.

McKoy said he plans to take the directory project into production next year and synchronize the Novell, Inc. NetWare 4.1 and Microsoft Corp. Windows NT directories in the future. He was unable to provide costs for the ongoing project.

In fact, predicting the costs of and returns on a corporate directory is tricky, Martin Marietta's Cleveland said. Though Cleveland could not provide the estimated costs, he is looking to complete the directory synchronization project in nine months and must see a one-year return on investment.

"As we look at further expansion into the client/server arena, we could potentially save some 15% to 20% both by leveraging the use of the X.500 standard in a variety of applications and by an overall reduction in maintenance costs," he concluded.

Radosevich is a Computerworld *senior writer.*

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HEAD START

Manipulating the Medium

Client/server is enabling much needed E-mail consolidation

AT CLEMSON UNIVERSITY, DEPARTMENTAL staffers cherish their independence and autonomy. Each department has its own computer budget, LANs and electronic-mail systems. And each group guards its turf fiercely.

But departmental empowerment has exacted a heavy toll: The agricultural college in Anderson, S.C., has unknowingly created an electronic equivalent of the Tower of Babel.
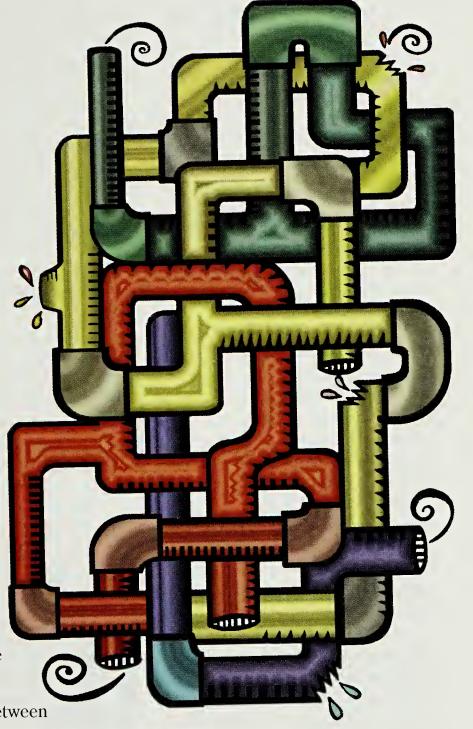
"The departments did not know how to talk between LANs [with E-mail] or to get onto the Internet," said David Condrey, a systems programmer at Clemson's Information Technology Center.

Over time, the university's various departments have installed a veritable "who's who" of hardware, including Macintoshes, MS-DOS and Windows boxes; Sun Microsystems, Inc. systems; Digital Equipment Corp. Alpha and VAX servers; and a Hitachi Data Systems Corp. 3090-class MVS/ESA mainframe. E-mail systems include Digital's All-In-1, WordPerfect Corp.'s Office and Microsoft Corp.'s Mail.

The university is working to blend these dissimilar E-mail systems into a plug-and-play client/server network using Simple Mail Transfer Protocol (SMTP), with extensions supporting Multipurpose Internet Mail Extensions (MIME) operating over a Post Office Protocol (POP) backbone spanning the entire campus.

Clemson is typical of what many organizations are undergoing today — the recentralization of departmental LAN-based E-mail systems and their conversion into a client/server environment.

"Over the last three to four years, with E-mail, IS has started to take over the messaging role within the department because of the realization that messaging is not a departmental responsibility but a corporate one," explained Karl Wong, principal analyst for PC and workgroup software at Dataquest, Inc. in San Jose, Calif.

That larger vision has, in recent years, been based on improving the bottom line. With communications

BY RICHARD ADHIKARI

forming an integral part of the Information Age, the melding of disparate E-mail systems into one larger system is fast becoming essential for companies to keep costs down.

At the very least, building a corporatewide network will reduce the number of people required to support different E-mail systems. "The human effort required to support E-mail will remain the most expensive system item," said Nina Burns, president of market research firm Creative Networks, Inc. in Palo Alto, Calif. Equipment charges can, after all, be depreciated.

The amount of money a company might save by consolidating disparate E-mail systems can be significant, as Northwestern Mutual Life Insurance Co. found. With 105 large offices and a "couple of hundred" smaller ones nationwide, the Milwaukee-based insurance company had several LAN-based E-mail systems as well as a host-based system running on an Amdahl Corp. MVS machine.

Administration was complex, connectivity could be improved, and the environment was anything but robust when it came to sharing attachments, according to Blane Woodard, manager of information systems. Over the years, the number of E-mail systems was reduced steadily, and the insurer decided to take a centralized, client/server approach to E-mail.

This decision was made after Northwestern Mutual reviewed some research from market research firm Gartner Group, Inc. in Stamford, Conn., and plugged in some of its own figures. "It appeared to us that, instead of needing two people to administer the centralized, client/server E-mail systems, we might need eight or 10 if we had stayed with LAN-based systems," Woodard said.

Last year, Northwestern Mutual bought Hewlett-Packard Co.'s Open-Mail client/server X.400-compliant backbone. It runs on HP 9000 minicomputers and serves 6,500 users. Currently, the firm has two other E-mail systems: EMC2 Tao, running on the Amdahl machine, which serves about 3,000 users, and a LAN-based system, Wang Office, that serves less than 200 and will be replaced with OpenMail this month.

A vestige of EMC2 Tao will be retained because it represents the E-mail communications between host applications and the HP Open-Mail system, and Northwestern Mutual will retain its legacy applications. However, everyone will have an HP OpenMail mailbox.

The move to client/server had some unexpected benefits, one of which is low network traffic. "In E-mail, the client/server models fly in the face of what we consider client/server," said Sharon Durland, an analyst at Aberdeen Group in Boston. "The servers, which run the E-mail engines, take much of the work load off the clients, which frees up the network."

This characteristic led to yet another, unexpected benefit for Northwestern Mutual: It has helped delay the purchase of a new mainframe for six months. Because a lot of host processing has been off-loaded onto the HP 9000 mail servers, the mainframes have not reached capacity as early as expected. "This is the benefit that has made people happiest," Woodard said.

He cannot tell how much that has saved the firm but said he has heard people bat around the figure of $100,000 a month.

There is another reason why client/server technology is becoming the rage in the E-mail world: It helps users avoid being locked in to one vendor. "The ability to separate the front end of the application from the engine is the main thing now," Durland said. This lets firms select interfaces and engines from different vendors.

For example, a firm that wanted to put in an X.400 backbone but whose existing E-mail packages were not X.400-compliant could substitute the backbone's engine for one that runs the X.400 protocol and continue using the old front end. "The user doesn't know, and he doesn't have to learn a new front end," Durland said.

Standardization is another key business driver in the move from diverse PC LAN-based E-mail systems to client/server-based centralized systems. "A lot of larger vendors like to have their vendors and customers on the same or compatible E-mail systems so they can conduct business through store-and-forward messaging," Dataquest's Wong said.

Standardization became the rallying cry at Clemson, for instance. When the university set up a task force charged with ensuring that E-mail enabled everyone to communicate freely, it realized it must bring rhyme and reason to its scattershot approach. Condrey was tapped to lead the charge.

But enforcing organizationwide standards was at odds with the uni-

Northwestern Mutual's move to consolidate E-mail has cut mainframe traffic, contributing to an estimated monthly savings of $100,000.

versity's culture. "Because of the budgetary setup here on campus, we can't really dictate what departments buy or use," Condrey said.

Therefore, the task force was left to impose an overarching architecture into which all existing components can plug.

Clemson opted to standardize on SMTP with extensions supporting MIME because most of the university's newer E-mail packages can utilize them in some form. POP was chosen as the backbone because many of Clemson's existing LAN-based E-mail packages have POP clients built in. POP will also let departmental users access two mailboxes with one front end: the one on their local server and the one on the campus server.

POP and SMTP will run on a dedicated Sun SPARCserver 1000 box running Unix, with about 4G bytes of disk and 32M bytes of RAM. This uses SendMail, the standard Unix mailer, and will be the campus server. The SPARCserver will also double as the server for the Internet, taking over from the HDS mainframe, which currently fills that function.

The melding of disparate E-mail systems into one system is fast becoming essential for companies to keep costs down.

Down the road, the task force will look into supporting Microsoft's Messaging Application Programming Interface and Vendor-Independent Messaging (VIM) from the VIM Consortium, which counts Lotus Development Corp. among its members, as well as Common Mail Call from XAPIA, the X.400 Applications Program Interface Association. The university needs to support one of the standard APIs to insulate itself against E-mail's ever-shifting technological sands.

Standardization is also the name of the game at General Electric Co. "At one time, every E-mail package known to man was installed at GE," said Dave Hay, who is based at the offices of GE subsidiary General Electric Information Services in Rockville, Md.

Last year, GE formed a center of excellence team charged with recommending a standard E-mail package for the firm. The team settled on two packages: Microsoft Mail and Lotus' CC:Mail.

Although GE is standardizing on Microsoft platforms, CC:Mail was included because some of GE's 13 subsidiary businesses had already committed to CC:Mail — they wanted CC:Mail's hierarchical post offices feature, Hay said.

Microsoft Mail will not have the hierarchical post offices feature to the same extent as CC:Mail until Microsoft's Exchange Server is available sometime next year.

Whether standardizing existing LAN-based E-mail packages or building new distributed schemes, the only way to get corporate executives' attention is to demonstrate the technology's contribution to cost savings or profitability, according to Creative Networks' Burns. No one is blinded by technology, she concluded. ▨

BACKBONE CAN CARRY THE BURDEN

At The Boeing Co., the complex interaction of multiple design, engineering and production workgroups makes E-mail standardization an impossibility.

As new projects come up, workgroups are allocated to them. These workgroups are hooked up to one or more of the existing E-mail systems. When the projects are completed, the groups are dissolved, but the E-mail accounts are retained for use by the next group.

"At one time, we had 17 different E-mail systems," recalled Roger Mizamori, manager of messaging services planning. This number has been trimmed to seven and will be reduced further. "It's not that we believe that we can get to just one mail system, but seven is quite an administrative burden," Mizamori said.

His solution is to link the various E-mail systems through an X.400 backbone, which replaces an aging SNA network on which about 60,000 accounts are registered. He will build it by wiring together X.400 message transfer agents (MTA), the first of which will come on-line later this year. "By going to X.400, we're making this a client/server setup," Mizamori said. The various front ends will be retained, and the back end will run off the IBM 3090 mainframes running MVS, he added.

The variety of E-mail systems in place has made directory synchronization at Boeing an "elaborate process." Each community maintains its own directory, and once a week, all the communities submit their directory updates. These are reconciled, entered into a consolidated directory in an Oracle Corp. database and distributed to the communities as flat files. The communities then load these flat files into their own formats. Much of this is done manually, and a lot of the file transmission is done in batches.

The complexity of this procedure has led Boeing to push for an industry-standard interchange format for directories. It is working through the directory synchronization technical subcommittee of XAPIA in Mountain View, Calif., for this.

Adhikari is a free-lance writer based in Toronto.

WHAT'S NEW

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┌─────────────────────────────────────────────────────────┐
│  ▼ │        Q+E        Administrator              │ ▼ │
├─────────────────────────────────────────────────────────┤
│ File  Edit  Tools  Help                                 │
├─────────────────────────────────────────────────────────┤
│  Group:                Users:           Max Rows        │
│  Accounting      ▼│  Fernandez, Maria ▼│    100         │
│ ┌───────────────────────────────────────────────────┐   │
│ │ Query │ General │   Tools   │    SQL    │         │   │
│ │                              Visible  Enabled     │   │
│ │ Allow user to open application    ⊠      ⊠    ▲  │   │
│ │   Revoke Message : (none)                        │   │
│ │ Allow user to modify databases    □      □       │   │
│ │   Revoke Message : Users in the Accounting group may not modify... │
│ │                                                  │   │
│ │ Allow user to define tables       □      □       │   │
│ │   Revoke Message : Users in the Accounting group may not define... │
│ │ Allow user to modify application options  ⊠  □   │   │
│ │   Revoke Message : In order to change your application options, you must... │
│ │ Allow user to print              ⊠      ⊠   ▼   │   │
│ │   Revoke Message : (none)                        │   │
│ ├───────────────────────────────────────────────────┤  │
│ │ Revoke Message:                                  │   │
│ │ Please call Eric at ext. 3100 if you would like to make changes to any datab │
│ └───────────────────────────────────────────────────┘  │
│ Ready                      Source : dBASEFile (c:\qe60\w1) │
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Intersolv's Q+E 6.0

TestDrive

INTERSOLV, Inc.'s Q+E 6.0 is the company's latest stab at creating an end-user query tool "so simple even a CEO can use it" while retaining the power, flexibility and control an information systems department demands.

While Q+E 6.0 may not be the ultimate query tool, its few weaknesses lie in the safest place — on the end-user side.

The product's flexibility is impressive: Icons and icon bars can be customized; 14 chart types are available; the Report Builder supplies four templates that can be infinitely modified and improved; scripts execute repetitive or scheduled functions; a drill-down feature can be implemented to show data detail with a mouse click; and a right mouse-button click brings up a menu of common functions.

Such flexibility could be confusing, especially for novices, but Q+E's documentation and extensive help system keep things organized. This is, after all, a product that is supposed to keep users from constantly bothering IS with query requests.

A short "Concepts" section at the front of the user manual introduces the database basics and Q+E 6.0 features necessary for making queries. Novices walk through a series of tutorials that teach them such functions as opening tables, creating and executing queries and printing reports. The manual is well-written and adequately indexed, and while it's not plain English, it's not bad.

Unfortunately, if users make a mistake, Q+E's cryptic error messages are enough to make them break out in a sweat. For example, if they click on the ADD CONDITION icon immediately after opening a table, "Q+E Error #1804" appears instead of a message simply telling them to select a value in the table first.

Despite the drawbacks, novices should soon be able to locate, sort and format their data with little effort — a situation that may scare some database administrators. Fortunately, Q+E 6.0 provides enough security features to keep curious and uninformed users from becoming too serious a drain on computer resources (see "Reeling in the Data," CSJ, August).

The Q+E 6.0 Administrator lets IS departments create group and user profiles that provide users with varying degrees of access to Q+E functions. Control-minded managers worried about conserving resources can restrict users to a few predefined queries. Trusted users can be given permission to create their own ad hoc queries, update records, perform joins and modify forms.

Administrators can assist users by creating customized icons that run predefined queries and perform other functions such as formatting and printing reports. These custom icons can be saved as icon bars and assigned to individuals or groups of users.

Database administrators will also be happy to see detailed on-line help for all script functions, Microsoft Corp. Open Database Connectivity (ODBC) drivers and other Q+E functions. Q+E supports more than 30 databases through ODBC, including Sybase, Inc.'s System 10, Oracle Corp.'s Oracle 6 and 7, The ASK Group, Inc.'s Ingres and Informix Corp.'s Informix 5.

Pricing: $199 upgrade for current users, $499 retail.

Intersolv, (301) 230-3780. ◪

Written by Christopher Lindquist, technical editor of Electronic Entertainment *magazine.*

INSIDE

■ **New products including Forte's application development tool, Sterling's file transfer software, Axent's security framework and Genesys' human resources application**

■ **Product Review: Windows NT Server**

News from the Marketplace

Genesys' Enterprise Series offers HR, benefits and payroll applications

APPLICATION DEVELOPMENT TOOLS

WHO: Forte Software, Inc., Oakland, Calif.

WHAT: General release of Forte's platform-independent application development tool, which includes a graphical user interface (GUI) designer, a fourth-generation language, class libraries, a class browser, an interactive debugger and a repository.

The environment automatically maps the application definition in the repository into the deployment environment and partitions the program among targeted servers and clients. Applications, which are expressed in terms of business functions or shared business services, can be repartitioned through a simple drag-and-drop procedure if usage patterns affect performance. Asynchronous notification of external events, such as real-time stock information feeds, is supported.

WHERE: Release 1 supports the following platforms: Data General Corp.'s Aviion; Digital Equipment Corp.'s Alpha/OpenVMS and OSF/1 servers and VAX/OpenVMS; Hewlett-Packard Co.'s PA-RISC; IBM's RS/6000; Sequent Computer Systems, Inc.'s Symmetry and Sun Microsystems, Inc.'s SPARC servers; Apple Computer, Inc.'s Macintosh System 7; Windows; and the Open Software Foundation's Motif clients.

Initial relational database support: Oracle Corp.'s Oracle 7, Rdb and Sybase, Inc.'s Sybase. Networks: TCP/IP and DECnet. Support for Microsoft Corp.'s Windows NT coming next year.

WHEN: Available since mid-September through value-added resellers and international distributors. Beta-tested at some 30 sites since July 1993. Fifty sites are currently using the product.

HOW MUCH: $75,000 for a core development system, which includes a license for five developers and 10 users, a choice of one client, one relational database interface and one server platform, a repository, a computer-based training course and five days of classroom training.

Additional developer and user licenses range from $4,000 to $6,000 and from $200 to $575, respectively, depending on the number purchased.

USER FEEDBACK: Medtronic, Inc. in Minneapolis, a $1.4 billion manufacturer of implantable medical devices, has developed a decision-support system that tracks customer relationships by contact name, products purchased and clinical projects.

The system, which runs on an RS/6000 and a VAX/VMS server running in tandem, accessed by Windows PC clients, will eventually roll out to 35 users, said Bill Bedor, director of information technologies.

PHONE: (510) 869-3400

WHO: Genesys Software Systems, Inc., a $20 million, Methuen, Mass., human resources, payroll and benefits applications software developer. The 13-year-old firm started as a mainframe software vendor but three years ago began transitioning to client/server, enabling its application suite to operate with a nonrelational, proprietary database engine. It has built a three-tier architecture to support industry-standard relational databases.

WHAT: Genesys Enterprise Series for Sybase SQL Server 10 offers human resources, benefits and payroll applications. The product's architecture separates the front-end GUI from application logic and the database system.

WHERE: Runs on Sybase SQL Server 10 on Sun's SPARC-based platforms under the Solaris operating system. Support for IBM AIX running on an RS/6000 and HP's HP/UX for the HP 9000 is expected by year's end. Support for Oracle and Windows NT is planned for next year.

WHEN: Currently available through Genesys' direct sales force.

HOW MUCH: Pricing starts at $125,000, based on software and hardware configurations and by size of organization using the software.

USER FEEDBACK: "From what we've seen, it comes a long way toward getting into the client/server arena," said Aaron Rosenblatt, director of sponsored programs, fiscal services, at the State University of New York at Stony Brook.

The university is using Genesys on the mainframe and is evaluating the new release. "We're attracted to it because of the possibility that it will make the transition smoother for us," he said, noting that the tools users are familiar with on the mainframe have been brought to the client/server release.

Rosenblatt said he likes the product's three-tier architecture: "That's the way we envision working here in two or three years," he said, adding that the university already operates in a highly distributed environment.

PHONE: (508) 685-5400
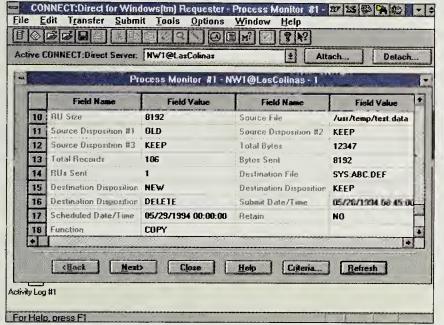
FILE TRANSFER SOFTWARE

WHO: Sterling Software, Inc., a $400 million-plus, Dallas-based developer of electronic commerce, systems software and government-related professional services.

WHAT: Connect:Direct for NetWare runs as a Novell, Inc. NetWare Loadable Module,

ronment.

Its security resides on top of NetWare to guard point of entry for communications and file transfer.

WHERE: The initial release will work with NetWare 3.12 and 4.01 with bindery emulation. It also supports NetWare for

Connect:Direct for NetWare has its own C-oriented scripting language for a holistic programming environment

providing a seamless link for transferring files between NetWare and other operating systems — MVS, Unix and OS/400 — on client/server networks.

The product, which has its roots in the mainframe world, features a modular GUI that offers point-and-click functionality for monitoring, requesting or sending communications or distributing software applications.

It also offers "work lists" that automate routine tasks such as grouping send and receive commands, submit local or remote processes and run local or remote programs.

The software has its own C-oriented scripting language and an application programming interface that integrates with NetWare to provide a holistic programming envi-

SAA and IBM LU6.2 services. TCP/IP support will be added with the next release.

WHEN: Available through Sterling's direct sales representatives.

HOW MUCH: $1,760 for two users and two concurrent sessions; maximum of 500 users, 20 concurrent sessions costs $14,800.

USER FEEDBACK: Great Western Financial Corp. in Chatsworth, Calif., claims to have achieved 10M byte/sec. transfer rates on its 16M-byte Token Ring network for distributing applications software to all branches and loan offices.

"It's working real well," said Randy Green, senior programmer. "We were working with a pre-beta release, and it was very easy to install."

PHONE: (800) 292-0104

SYSTEMS MANAGEMENT
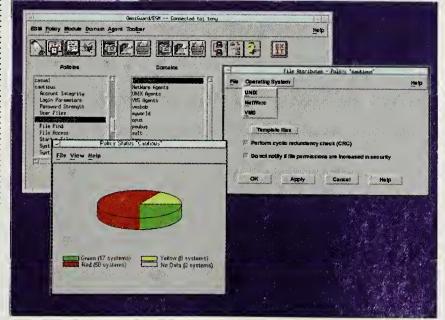
WHO: Axent Technologies, a recently formed, $10 million division of Raxco, Inc., a Rockville, Md., systems management vendor.

WHAT: OmniGuard contains six software modules and a framework that provides security management; user administration; systems monitoring/intrusion detection; user identification and authentication; automated file migration to near-line or off-line storage; and systems backup for heterogeneous client/server networks. The agent-based software helps organizations establish security policies.

WHERE: The system will eventually operate across Novell's NetWare, Windows/DOCS, Unix, Digital's OpenVMS and Microsoft's Windows NT. Axent plans to extend the architecture to MVS mainframes.

WHEN: Four of the six modules (Enterprise Security Manager, Enterprise Access Control; Enterprise Backup Manager and Autostore) are available

HOW MUCH: There are three pieces to each module: user interface, manager server and agent. Unix user interface and server are priced at $1,995; agents cost $395. Novell interface and server costs $595; agents cost $395. OpenVMS interface and server lists for $2,495; agents cost $695. Autostore and backup modules are priced according to storage capacity.

USER FEEDBACK: Two early users, Citibank NA in New York and Mobil Corp. in Dallas, are satisfied with the modules that are available. The two firms experienced nothing unusual in getting beta code and early release software up and running, noted IS managers at both companies, who were interviewed just after the software's August debut. This ease of operation may be attributed to the fact that both companies are long-time Raxco customers. Both companies said they are anxiously awaiting the single

Axent's OmniGuard involves agent software to help users establish security policy

now; Intruder Alert will be available in December, and Single Sign-on will ship early next year.

sign-on capability of the product suite, which will not ship until next year.

PHONE: (301) 258-2620
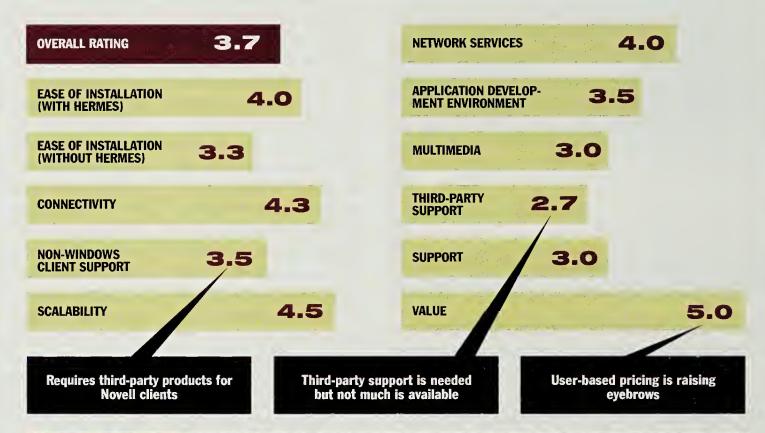
The Client/Server Journal New Product Review is an evaluation based on interviews with major users at corporate and educational installations. The product under review is being used in a production environment. Ratings are based on user expectations on a 1–to–5 scale, where 1 is below expectations and 5 is above expectations. Ratings are listed in order of importance to users.

Windows NT Server

Microsoft Corp., Redmond, Wash. ☎ *(206) 882-8080*

OVERALL RATING 3.7	**NETWORK SERVICES** 4.0
EASE OF INSTALLATION (WITH HERMES) 4.0	**APPLICATION DEVELOPMENT ENVIRONMENT** 3.5
EASE OF INSTALLATION (WITHOUT HERMES) 3.3	**MULTIMEDIA** 3.0
CONNECTIVITY 4.3	**THIRD-PARTY SUPPORT** 2.7
NON-WINDOWS CLIENT SUPPORT 3.5	**SUPPORT** 3.0
SCALABILITY 4.5	**VALUE** 5.0

Requires third-party products for Novell clients

Third-party support is needed but not much is available

User-based pricing is raising eyebrows

Installation descriptions for users who evaluated Windows NT Server	Systems Integrator	Retail	University	Pharmaceutical
NT Server version	3.1, 3.5	3.1	3.5	3.1, 3.5
Number of clients	2,500	160	200	30
Client operating systems	Windows for Workgroups, Macintosh System 7, Unix, DOS/NetWare	Windows for Workgroups, Windows, NT, OS/2	Windows for Workgroups, DOS 6.02, DOS 3.14	Windows, DOS
Network services	SQL server, Domain directory, Novell services	SQL server, Domain directory	Systems Management Server, SQL server, Domain directory, PPP	SQL server
Other network operating systems	Digital Pathworks	Novell NetWare 3.11	Microsoft LAN Manager	Novell NetWare 3.11

Microsoft's NT Server Still a Contender

Version 3.5 demonstrates considerable improvements in connectivity, though it still lacks third-party support

THOSE WHO WERE PLANNING TO DISMISS MICROSOFT CORP.'S WINDOWS NT SERVER AS A long-term option after experiencing Version 3.1 had first better take a look at Version 3.5.

Four users who recently evaluated Version 3.5 recounted considerable improvements in speed and functionality over Version 3.1. Users especially liked its connectivity, which had been described as LAN Manager- or Novell, Inc. NetWare-like but was enhanced with dial-up access and TCP/IP compatibility, making it more viable for wide-area networks.

NT Server's weakness is its lack of third-party support. "It seems that Microsoft is leaving many important elements like dumb terminal support, batch scheduling and connectivity for Novell clients up to third-party products. The problem is, very few are available," said Darrell Ward, one of the evaluators and client/server specialist at Perot Systems Corp. in Auburn Hills, Mich.

INSTALLATION

Users expected an involved installation process, especially when adding Systems Management Server into the mix, but described one that was easy and predictable.
University: "When you take NT, the network, the domain, SQL server, then add Hermes on top of it, you end up with a very complex system that amazed us with its ease of installation."
Systems Integrator: "I expected extra complexity and work when adding Hermes; it just never seemed to come around."

CONNECTIVITY

Version 3.5 adds a wide-area networking capability unavailable in Version 3.1.
Systems Integrator: "After using Version 3.1, we questioned if NT was the direction we wanted to go in. Version 3.5 gave us the dial-up access we needed, making it a viable long-term option."
University: "We are now able to have TCP/IP at remote sites and are getting throughput of 1.6K byte/sec. through V.32 modems for mail, file and even management services."

NON-WINDOWS SUPPORT

Evaluators described a buggy Macintosh integration and a Novell connection that required third-party software to work properly.
Systems Integrator: "We had to use Beame & Whiteside Software's Multiconnect for Windows to give us the file and print services for our Novell clients. Without it, all you get is RPC-type access. The Macintosh connectivity is there, but we found a lot of bugs in the security system, like passwords not going through correctly."
University: "In a normal Macintosh environment, you have the ability to set up a single Mac volume, called users, and each user on the system would be listed in there.

"NT Server did not allow that to happen. You have to set up a separate volume for every user. And when you have 250 Mac users, that is no way to spend your afternoon."
Retail: "Because our Novell clients are also Windows-based, we had a smooth integration. The Macintosh access looked promising in our tests. Everything is displayed the way you want to see it, and it accesses the server very quickly."

SCALABILITY/ROBUSTNESS

Within the Intel Corp. platform, NT's ability to serve an increasing number of clients is unmatched. Users run into problems when they start scaling across hardware platforms.
Retail: "Scalability within the PC platform is great. The problem is when you bump up to a Mips or Alpha architecture because the applications are not there yet."
Systems Integrator: "Because there are no plans for NT Server to support dumb terminals, it will be difficult for companies that still have a lot of them to choose NT [Server]."

NETWORK SERVICE SUPPORT

Evaluators said they were very satisfied with the basic network services such as the domain directory and naming services, but the SNA gateway received mixed reviews.
Systems Integrator: "All the network services are there and work great, but our problem is with the SNA gateway's inability to process TN 3270. Without it, we cannot get access to the mainframe."
Pharmaceutical: "Our Novell environment required a separate physical SNA gateway. With [NT] Server, I just had to plug the Token Ring card into the system."

INDEPENDENT BENCHMARK

Microsoft's SNA Server 2.1

running on a Dell Computer Corp. 486/66-MHz PC with Windows NT Server 3.5 was benchmarked to be 300% faster than NetWare for SAA 1.3 with NetWare 4.01 on identical hardware. The mainframe-to-PC file transfer test, commissioned by Microsoft, was conducted by The Tolly Group in Manasquan, N.J.

As background sessions were added, SNA Server showed only a slight increase in file transfer times, while NetWare for SAA had a significant increase.

DEVELOPMENT ENVIRONMENT
Users found the development languages fully functional, with few drawbacks.
Systems Integrator: "The tools provided are fantastic in all environments. Even the third-party products, which are all starting to look more like Visual Basic and Visual C++ environments, are great."

Pharmaceutical: "Because Visual Basic 32 is not yet available, you do not have the [Visual Basic] wrappers that would pull the NT APIs the same way that C allows you to do."
University: "We used Visual Basic as the glue to pull other applications together. It was easy, and the applications work fine.

"We mounted the World-Wide Web on [NT Server] 3.5, then Mosaic, which gave our users an interface and a browsing method that lets them access the outside world beyond our own network."

MULTIMEDIA
Multimedia capabilities were not fully tested by the evaluators, who felt they belonged on the desktop, not the network.
University: "The hardware and software required to get the bandwidth needed and a desirable resolution makes the systems too complex

for the average user. I think multimedia projects should stay on the client."

SUPPORT
You get what you pay for. Those that pay for the premier support expressed only praise; those that send their bugs to Microsoft's Internet server may never get a response.
University: "I have always received a phone call or E-mail response to my questions for other Microsoft beta products. But sending 3.5 bugs to their Internet file transfer protocol server the way Microsoft wants them, you don't even get an acknowledgment."
Pharmaceutical: "I'll connect to their FTP server, but what I get is an open port that never answers back that it's finished. Although when I call Microsoft and tell them I'm on a production system, I will get a call back that day."
Systems Integrator: "Because we have the premier

support, we have never waited more than one hour for a reply."

VALUE
Evaluators said they felt they were receiving a bargain when comparing NT Server's cost with Novell's. However, the $35-per-user charge Microsoft has planned to connect NT clients to NT Servers is hard to swallow.
Systems Integrator: "Microsoft's decision to go to user-based licensing might push the cost up closer to Novell if you have 250 to 300 users. It's great if you only have 50 to 60 users."
Pharmaceutical: "You get a lot of features and robustness for what they charge. I cannot see how Novell can maintain its current pricing." ◼

Compiled by Kevin Burden, Computerworld's *senior researcher, Firing Line/ Scorecard.*

MICROSOFT RESPONDS

MACINTOSH INTEGRATION:
The one limitation Microsoft is aware of is with encrypted passwords. Since the standard User Authorization Modules (UAM), which ship with every Macintosh, do not support encrypted passwords, Microsoft provides a UAM that does.

However, because Apple Computer, Inc. does not document the interfaces that support the ability to mount or automount volumes by double-clicking aliases to network volumes, Microsoft cannot provide this functionality.

NOVELL INTEGRATION:
Microsoft includes in every copy of Windows NT Workstation and Window NT Server a Microsoft-written redirector that allows any Windows NT workstation or server to connect to Novell NetWare.

FILE RESTORATION:
We do not have any documented problems reported on this issue

of overwriting files during a restoration. The confusion might be with the transition from long file names to short file names. A file that had a long file name and was then given the short name Micro~1 will be restored as Micro~1 unless there is a file already on the system with that name. In that case, the restored file will then be renamed Micro~2.

The user perception might be that it was overwritten, but in fact, all the data is there.

SUPPORT:
The FTP server is an information server; it's not a place where we provide support. We might not have been as clear as we should have been about its functions.

COST:
Even with 1,000 users, Microsoft's pricing structure is still below Novell's.

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Beyond a Pretty Face

JUDITH HURWITZ

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I recently talked to a project leader charged with selecting a client/server development tool for his organization. He had seen about 10 tool demos and could not tell the tools apart. He asked if they were really all the same. The answer, of course, is no. But the real answer to his problem is that he is evaluating tools the wrong way.

My advice is simple: Do not let a vendor just demonstrate how well a tool can place push buttons and sliders on a screen. Instead, force vendors to demonstrate how to build application logic with their tool.

Does this mean that graphical presentation is unimportant for client/server tools? No, it is extremely important because it is the mechanism that reveals the way users interact with the underlying business logic. The good news for users is that most of the application development tools on the market are reasonably good at providing a graphical environment.

In such a competitive market, you must have tools that will demo well and look pretty. But a pretty face may be only skin deep. If the tool is incapable of creating sophisticated logic, it is hardly worth the trouble. So what should you do if you are beginning to evaluate client/server development tools? Here are some guidelines:

- Review a vendor's standard demo to get a sense of the environment. This will also show you what the company believes are the highlights of its product. But don't stop there. A canned demo is just that — canned and well-controlled. You need to understand how this tool will solve your problems.
- When you ask to see how the tool works, refuse to let the vendor show the screen builder. Save that for last. (I have seen many marketing reps break out into a cold sweat when you don't let them build a screen for you, so be prepared for resistance.) Instead, create a scenario that will help you determine how capable the tool is for building complex logic.

For example, if you work at a manufacturer, ask the vendor to demonstrate the process for tracking the production of a product and several of its key characteristics (e.g., size, shape, weight), customers and ship date. Don't make the scenario so complex that the vendor needs five months to develop your demo. On the other hand, put some complex logic in the scenario so you have a handle on how the tool will perform in the real world.

- Drive the demo yourself. This accomplishes two things. First, it allows you to get a feel for what the tool is really like. You will see things that an experienced demonstrator will perform effortlessly but that are, in reality, very difficult. Second, you will gain an understanding of what your developers would experience.
- When you finally understand how to build business logic with the tool, sit back, relax and build the graphical part of the application.

By following these guidelines, you will be better able to separate the pretty face from the well-designed development tool. And you will be better able to select which tool has the capabilities that best suit your development needs.

But this is only a starting point. Even the best demo, followed by a pilot test, will not prepare you for possible scalability and interoperability surprises. You will not discover some of these issues until you are well into development. But you can save yourself anguish if you have at least selected a tool that can handle complex application logic creation. ◪

Do not let a vendor just demonstrate how well a tool can place push buttons and sliders on a screen.

PeopleSoft answers 4 critical client/server questions.
(No asterisks, no equivocations.)

1. How many years of client/server experience do you have?	6
2. Do you have both financial and human resources applications available and in production?	Yes
3. Are all your applications developed from the ground up for client/server?	Yes
4. How many RDBMS platforms do your applications run on?	6

Ask other client/server vendors those questions. You'll find that most of them are still new to client/server. And not prepared to support you in a client/server environment.
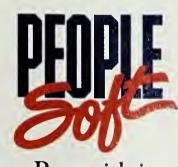
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Only PeopleSoft applications give you a choice of six RDBMS platforms. So you can use the same applications whether you're upsizing to a mainframe, downsizing to a LAN, or 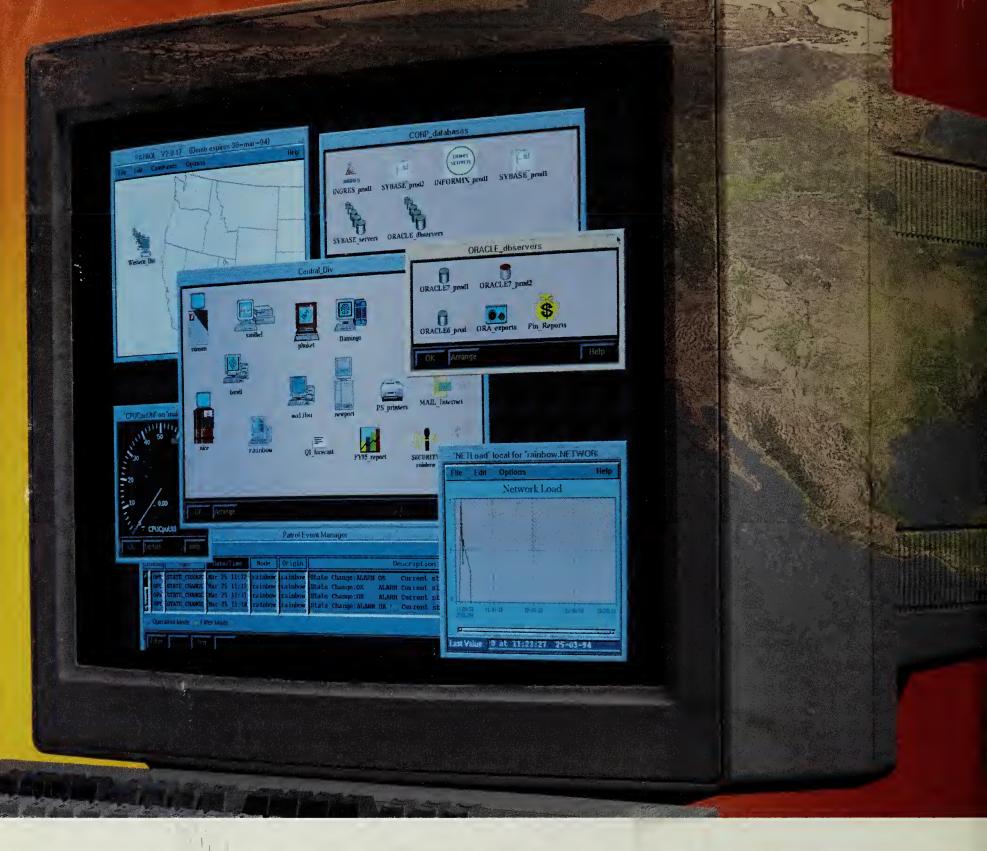rightsizing to anything in between. We build on the best of today's technology to reengineer traditional business systems. And deliver scalable, functionally innovative applications developed specifically for client/server and Windows.

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